The Impact of Virtual Exchange on Teachers' Pedagogical Competences and Pedagogical Approach in Higher Education

EVOLVE Project Report

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Evidence-Validated Online Learning through Virtual Exchange

About this publication

This study is an output of the Erasmus+ Forward Forward-Looking Cooperation Project EVOLVE (https://www.evolve-erasmus.eu), under Erasmus+ Key Action 3: Support for policy reform, Priority 5 – Achieving the aims of the renewed EU strategy for higher education (Erasmus+ project: 590174-EPP-1-2017-1-NL-EPPKA3-PI-FORWARD).

The project aims to mainstream Virtual Exchange (VE) as an innovative educational practice in Higher Education Institutes (HEIs) across Europe and runs from 1 January 2018 to 31 December 2020. It is coordinated by the University of Groningen, The Netherlands. The other partners in the project are: The University of León (Spain), University Grenoble Alpes (France), The Open University (United Kingdom), Jan Dlugosz University (Poland), University of Padua (Italy), University of Warwick (United Kingdom), Malmö University (Sweden), Sharing Perspectives Foundation (the Netherlands), Soliya/Search for Common Ground (Belgium), Coimbra Group (Belgium) and SGroup (Belgium).

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Executive summary

The following report presents the outcomes of a study on the effect of implementing Virtual Exchange on the evolution of teachers' pedagogical competences. In the report we use the term Virtual Exchange (VE) to refer to sustained online interaction between peers who are geographically distant and/or from different cultural backgrounds and affiliated to different Higher Education institutions, supported by their respective teachers and eventually facilitators[1].

This pedagogical method, due to its high versatility, can be adapted to address various educational contexts, hence its growing popularity. While various aspects of students' participation in VE projects have attracted numerous research studies, little is known about how VE design and delivery stimulate, if at all, teachers' professional growth.

The study is part of a large-scale research conducted within the EU-funded Erasmus+ KA3 project EVOLVE (Evidence Validated Online Learning through Virtual Exchange, see section 1.3) into the impact of Virtual Exchange as an educational method in Higher Education contexts. The current report concentrates on how the process of designing, implementing and carrying out VE affects the teachers involved. In particular, it investigates how they view the evolution of their general teaching competence, their VE-related competences as well as their approach to nurturing student-centeredness and other active pedagogical approaches in the academic courses they teach. The study also casts light onto the motives behind VE implementation, the targeted learning objectives and teachers' perceptions of VE-related challenges.

The report presents the research hypotheses that guided the study, the research methodology and data analysis and it concludes with the description of the findings. The study confirms that VE implementation is a powerful learning environment not only for students, but also for the teachers involved. It shapes and refines teachers' general professional competences commonly linked to quality teaching, such as course design skills, organisational skills, flexibility and the ability to adapt, as well as student-centeredness.

Last but not least, implementing VE makes teachers develop a set of VE-specific skills such as VE task design, digital competence or the alignment of tasks and tools, all of which enrich teachers' repertoire of instructional approaches, methods and techniques and embed into other teaching contexts.

Our results furthermore bring to light an interesting observation that teachers refine, on their side, those transversal competences that VEs generally target on the students' side. These include intercultural competence, cooperation skills, and language skills. Moreover, the experience of setting up, organising and guiding students in a VE is highly valued by teachers with regard to collegial collaboration with their international teacher partners.

[1] see https://evolve-erasmus.eu/about-evolve/what-is-virtual-exchange/

1. Introduction

1.1. Focus of this study

This report presents a large-scale study on the impact of Virtual Exchange (VE) on the development of Higher Educational (HE) teachers' pedagogical competences. The study was conducted by the EVOLVE research team and investigates the evolution of these competences within a range of different VEs implemented in various Higher Education institutions across the globe. The study puts a specific focus on the development of multiple pedagogical competences which are seen as being central to quality teaching, such as task design skills, identification of learning goals, clarity of task instructions and increased teacher reflection. The study also seeks to provide evidence that the implementation of VE positively impacts those pedagogical qualities which foster student-centeredness. Moreover, the study investigates the development of VE-specific competences and their potential transfer to other contexts.

The report outlines the initial research questions, methodology, collected data and results of this study. It also highlights other factors which appear to be crucial for teachers' professional competence development through VE. A competence is defined here, in line with the recommendations of the European Parliament and the council of the European Union (2006/962/EC) as "a combination of knowledge, skills and attitudes appropriate to the context" (p. 4). In order to provide evidence for this initial working basis and hypothesis, two rounds of data collection were carried out. A first EVOLVE pilot round study with a limited number of participants was conducted between autumn 2018 and June 2019. Its goal was twofold: first, to test the protocols for data collection and analyses that the project members had designed, in order to adjust the protocols for the second round. And, second, to get the initial results. This report is based on a second round of data collection, which took place from autumn 2019 to April 2020 and adopted the adjusted protocols. By using these on a broader number of teachers, it seeks to provide the large-scale evidence for the benefits of VE that EVOLVE reaches out for. The results show that the process of designing and implementing a VE can be a powerful way of fostering and sustaining teacher development regardless of their teaching experience. Consequently, VE is considered in this research as a learning environment in which teachers develop themselves along with the participating students.

1.2. What is Virtual Exchange?

Virtual Exchange (VE) is a specific form of online communication and collaboration between students that is put into place in various forms in educational contexts. The underlying definition of VE that will be used in this report was developed at the very beginning of the EVOLVE project in January 2018 by the EVOLVE consortium. It is published on the project website:

> *Virtual Exchange (VE) is a practice, supported by research, that consists of sustained, technology-enabled, people-to-people education programmes or activities in which constructive communication and interaction takes place between individuals or groups who are geographically separated and/or from different cultural backgrounds, with the support of educators or facilitators. Virtual Exchange combines the deep impact of intercultural dialogue and exchange with the broad reach of digital technology.*
>
> (https://evolve-erasmus.eu/about-evolve/what-is-virtual-exchange/)

1.3. Background to the study: the EVOLVE project

The EVOLVE project aims to contribute to implementing Virtual Exchange (VE) in Higher Education (HE) at a larger scale, since this innovative collaborative international form of learning is still underutilised at present. This is to be reached through 1) raising awareness among HE institutes within Europe and beyond, as a tool for internationalisation, 2) setting up and providing online training for educators, 3) and providing decision-makers at international, national and local levels with large-scale evidence for the benefits of VE for the development of student and teacher competences at Higher Educational level. This way, EVOLVE seeks to contribute to evidencing elements that will "empower key stakeholders in developing and mainstreaming policy innovation" (Priority 5 of the Erasmus+ KA3 call for projects).

This report, which focuses on the teachers' perspective and competence development is completed with other parts of the EVOLVE research that concentrate, respectively, on *The Impact of Virtual Exchange on Student Learning in Higher Education* (EVOLVE Project Team, 2020a; available as a separate EVOLVE report) and, through a baseline and monitoring study, on measuring the current state of awareness of VE as a tool for internationalisation within HE. The results of a first baseline survey, conducted in September/October 2018, are available as a separate report (Jager *et al*. 2019). Furthermore, complementary case-studies on institutional integration and support of VE were undertaken (EVOLVE Project Team, 2020b), and a second iteration of the baseline survey will take place in winter 2020). These data allow us to measure the impact of the current initiatives aiming at awareness-raising and upscaling VE, and to gain a better understanding of the keys to institutional implementation of VE.

In parallel to EVOLVE, other projects and initiatives have been undertaken that contribute to better implementing VE within HE, but which have a more specific focus, such as the recently finished EVALUATE project[2] which targets more specifically initial teacher training, and the concurrent Erasmus+ Virtual Exchange project[3] which targets VE between European and Southern Mediterranean countries and which includes synchronous online sessions, facilitated by a moderator, focusing on intercultural issues. Both these projects have in the meantime demonstrated the impact of VE through specific impact studies (The EVALUATE Group, 2019; Helm & Van der Velden, 2019; Helm & Van der Velden, 2020).

1.4. Structure of this report

This report has been divided into six chapters. Chapter 2 provides the description of the research methodology, which includes information about research questions and hypotheses, the type of research employed, data collection methods as well as the types of data and their methods of analysis. The chapter concludes with an overview of limitations to the study. In chapter 3 we present an overview of the retrieved data and the information about research participants. Chapter 4 presents the reasons behind teachers' decisions to implement VE, followed by the overview of learning objectives they target in their VE-enhanced courses. Chapter 5 provides a detailed analysis of the relevant quantitative and qualitative data pertaining into those aspects of teacher pedagogical competence that are influenced by their experience of designing and

[2] https://www.evaluateproject.eu/

[3] https://europa.eu/youth/erasmusvirtual_en

delivering VE projects. More specifically, it addresses general teaching competences, the development of competences directly related to VE, as well as teachers' approaches to student-centeredness. The report concludes with chapter 6 in which the discussion and study findings are presented.

2. Research methodology

2.1. General research questions and hypotheses

The research presented here was guided by the assumption that the process of designing and delivering VE has an impact on the evolution of professional competences of the teachers involved. In the study we followed the definition of competence provided in the recommendations of the European Parliament and the Council of the European Union (2006/962/EC), in which it is conceptualised as "*a combination of knowledge, skills and attitudes appropriate to the context* " (p. 4). Since pedagogical competence is a very broad and dynamic term, especially when considered in the context of online or blended learning environments, one of the first steps taken by EVOLVE researchers was to investigate related literature and identify themes and categories which may be included in an operational definition and serve as indicators of teachers' potential evolution.

In spite of a growing number of studies on VE, among which several acknowledge the valuable contribution of VE to the initial training of future teachers (The EVALUATE group, 2019; Kurek & Müller-Hartmann, 2017; Vinagre, 2017), VE as a tool for continuous teacher training and competence development is an almost unwritten page within research on VE. This study, therefore, draws on literature from related fields and with a similar focus, namely a framework for teacher competences (SOTL: Bernstein & Bass, 2005; Biémar *et al*., 2015), European recommendations for teachers (European Union, 2006; 2018), the purposeful integration of technology into teaching contexts (TPACK, Mishra & Koehler, 2006) and online teaching and learning (Garrison 2006; Hampel 2006). It also draws on the related fields of blended teaching and learning (Garrison & Vaughan, 2008; Nissen, 2019), constructive alignment (Biggs & Tang, 2013) and task design (Kurek & Müller-Hartmann, 2018), including the studies on competences a telecollaborative teacher should have (O'Dowd, 2013, Dooly, 2010), and the competences targeted and achieved through initial teacher training. On this basis, three major categories were identified in which the potential impact could be observed. These include 1) general pedagogical competence; 2) VE-related teaching competences; and a broadly understood category of 3) approaches to student centeredness. More specifically, the following skills and subcategories supporting quality teaching have been identified and addressed in the data collection instruments:

A. Being able to constructively align the course (clearly formulate learning objectives of the course / put into place tasks that allow students to meet these objectives / put into place assessment tasks that meet these objectives);
B. being able to align technologies with learning objectives and tasks;
C. being able to put into place tasks that engage/motivate students;
D. being able to put into place tasks that allow students to think critically;
E. being able to clearly present course goals, task instructions, course structure, *etc*. to the students;
F. being able to align one's teaching role in accordance with task / course demands and constraints;
G. being able to foster students' communication and/ or collaboration;
H. being able to choose appropriate feedback and assessment methods and techniques;
I. being able to reflect on one's teaching;

J. being interested/ involved in continuous professional development either individually or in a community;
K. being able to adapt one's teaching to available resources and constraints;
L. feeling comfortable selecting technology for one's VE/ one's teaching;
M. being able to design a VE;
N. being able to carry out/implement a VE.

Based on the above, the research presented here was guided by the overarching question about the impact that the process of designing and delivering VE projects has on teachers' pedagogical competence. More specifically, EVOLVE researchers sought answers to the following research questions:

- Which aspects of teachers' pedagogical competence, if any, are affected by teachers' VE experience?
- Which VE-related skills and competences do the teachers develop?
- Which aspects of student-centeredness evolve in response to teachers' VE experience?

Elaborating on the aforementioned aspects of quality teaching, the following hypotheses were formulated for the study:

Hypothesis 1: The process of designing and delivering VE has an impact upon teachers' general teaching/ pedagogical competence.

Hypothesis 2: The process of designing and delivering VE has an impact upon teachers' skills and competences directly related to VE.

Hypothesis 3: Teachers' implementing VE in their academic courses shift their teaching from knowledge transmission towards student-centeredness.

2.2. Type of research

The study reported in this document is based on descriptive research, in which respondents' individual viewpoints and characteristics are analysed to develop a better understanding of the progression of their personal and professional attributes. In so doing we followed a mixed methods approach (Brown & Coombe, 2015, p. 78) which allows for the integration and analysis of both quantitative and qualitative data. While the former type makes it possible to identify dominant trends and patterns in participants' responses, the latter allows researchers to support them with specific examples, and to provide a deeper insight into respondents' motives and perceptions.

In the current study, the evolution of teachers' competence was measured through the comparison of how they perceived their own competences before and after VE implementation. All empirical data were obtained at post-stage, which resulted from the adjustment of research protocols after the pilot round (see Nissen & Kurek, forthcoming, and section 2.2.1). The following data analysis stage aimed at providing evidence on the evolution, or rather development of competences which, although observed by the authors of this report in their work with VE teachers, had not been researched to date.

2.3. Research methodology

In order to address the research questions, two major data collection tools were designed, namely surveys and interviews. The following part of the report presents the conception and evolution of research protocols, the process of data collection and analysis as well as limitations to the study.

2.3.1. Method of conception of data collection protocols

It follows a mixed methods approach, combining the collection and analysis of quantitative and qualitative data (Brown & Coombe, 2015: 79). Whereas our quantitative analyses aim at large-scale objective measures, our qualitative analyses are intended to gain deeper insights which allow for elaboration, clarification and exemplification of the quantitative data. In some cases , it also allows for examining divergence between quantitative and qualitative results.

The research is based on empirical data collected in the form of teacher perceptions. It compares these perceptions as self-reported by teachers at a pre- and a post-stage in surveys and interviews. The research protocol included two major rounds of data collection, the first of which, conducted between April - July 2019, served as a pilot. At this stage, the respondents were selected from participants of the EVOLVE training and mentoring scheme. Their responses were collected during pre-, mid- and post- stages through a Qualtrics survey. Due to a relatively small number of responses, especially from teachers responding at all the three stages, and lack of consistency in the amount and intensity of the training received, the protocols for the second round of data collection were modified. As a result, the following adaptations were implemented:

- addressing VE practitioners regardless of their previous participation in any form of VE dedicated training ;
- using surveys and follow-up interviews as main data collection tools;
- focusing on three major aspects: general teaching competences, VE-related competences and enhancing student-centeredness;
- collecting data at post stage, where teachers were asked to compare their levels of competence before (pre-stage) and after (post-stage) putting into place one or several VEs, in order to detect self-perceived changes in their competence development .

2.3.2. Data collection and types of data

As indicated above, the data used as a basis for the study were collected in two rounds: first in 2018, and then in 2019-2020. The first round of data collection served as a pilot which allowed for the readjustment of research instruments and procedures. The data reported in this report come from the second round completed in the period of Fall and Spring 2020. It is based on qualitative and quantitative data collected from a group of 53 VE practitioners. In order to maximize data value, two compliant data collection tools were used, namely surveys and complementary interviews.

Surveys used closed and open-ended questions to ensure the provision of quantitative and qualitative data (see Appendix A). In closed questions a 6-point Likert scale was mainly used to probe into participants' views on self-perceived evolution in various aspects related to pedagogical competences. The surveys were designed and distributed online via Qualtrics.

Complementary **interviews** were conducted with selected survey respondents. Their main purpose was to collect data with regard to the third hypothesis (a shift from transmission teaching methods to more student-centered ones, and allowing for more space for interaction). The interview questions consisted of an agreed core set asked to all 10 interviewees (see Appendix B), and supplementary questions which sought clarification of the interviewee's particular survey responses. Therefore, by providing information supplementary to the surveys, the interviews contributed to a better understanding of the survey results.

Teachers participating in the second round of data collection were reached either directly, through the EVOLVE project's and researchers' social networks or through VE community mailing lists, and informed about the purpose of the data collection process.

2.3.3. Preparation of data for analysis

The survey data were extracted from Qualtrics for further processing. Entries from respondents who referred to other practices than VE (such as fully online teaching in times of COVID, or other types of online teaching) were removed. The remaining entries were anonymized by replacing the teachers' name with an ID code composed of T, for "teacher", and a number from 01 to 53 attributed in chronological order of survey completion (e.g. "T01"). This file was then used for statistical analysis with R[4] and R Studio[5] as well as for discourse analysis with NVivo[6] (see 2.3.4).

The 10 recorded student interviews were entirely transcribed. For this purpose, the EVOLVE team first used a tool for automatic transcription, and then checked for consistency of this transcription, modifying it where appropriate in order to eliminate mistakes in speech recognition or wrong spellings for homonyms.

Both survey and interview data were uploaded into NVivo, and data collected through both tools stemming from the same person (e.g. from T08) attributed to the relevant anonymous ID code. This merged NVivo file was then used by the EVOLVE researchers for the identification of relevant coding categories and, afterwards, for the coding and analysis of the data.

2.3.4. Types of analyses that were conducted

In the study quantitative and qualitative analyses were used, both of which will be described below.

Quantitative analyses

Our quantitative observation of the evolution of participants' competences is based on a comparison of their declared competences at different stages, indicated on a 6-point Likert-scale in our survey. The first step undertaken in the process of data analysis was to check the data distribution and outliers. After that paired t-tests were used to measure the statistical relevance of differences between participants' pre and post self-assessment in relation to each statement. Statistical significance was calculated at $p < 0.05$. The variables were normally distributed based on skewness and kurtosis values and the sample size was larger than 15 throughout (see Mircioiu & Atkinson, 2017). This rendered unnecessary the use of non-parametric tests (e.g. Wilcoxon), contrary to the pilot study where the sample size was in some cases small and data highly skewed.

[4] https://cran.rproject.org/bin/windows/base/
[5] https://www.rstudio.com/products/rstudio/download/
[6] https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

In order to check for statistical correlations between several quantitative post-survey items, Pearson's Correlation test was used. All statistical analyses were carried out with the help of the tool R.

Qualitative analysis

The qualitative data, understood as verbal data here, were obtained from surveys and interviews (see section 2.2.2). They were analysed with help of NVivo 12 software. To this end, firstly categories (or "codes") were identified with regard to the respective research question and scope. The elaboration of these categories followed a twofold approach: it was based on a literature review and earlier studies on the one hand, and on successive phases of analysis of the EVOLVE data set adjusted to the emerging findings, on the other hand. A category, or "code", will therefore be considered in this report as "*a researcher-generated construct that symbolizes and thus attributes interpreted meaning to each individual datum for later purposes of pattern detection, categorization, theory building, and other analytic processes*" (Saldaña, 2013, p. 4). The EVOLVE researchers were careful to elaborate qualitative coding categories parallel to the quantitative ones where appropriate.

Triangulation of data

The research presented here followed a mixed methods approach (Brown & Coombe, 2015), in which data collected by means of different tools (surveys, interviews), at different moments (see section 2.2.2), from different VE contexts (see overview on retrieved data in chapter 3) and of different nature (quantitative, qualitative) are combined and compared.

2.3.5. Limitations of the study

The research procedures presented here are not without their limitations. The purpose of the study was to address a possibly vast array of academic disciplines, which was also reflected in the process of reaching out to potential respondents by distributing the survey through various VE-oriented networks (UNICollaboration, EVOLVE, EVALUATE).

However, most of the responding teachers come from the field of language studies, language training and teacher training (see section 3.1), the possible reason being students' language fluency, a focus on new pedagogical solutions as well as the character of researchers' own professional networks. The dominance of a limited number of disciplines can be perceived as a bias, as it may impact respondents' familiarity with certain pedagogical concepts or the awareness of their own pedagogical evolution. Therefore, in the process of recruiting the interviewees, special attention was paid to addressing a broader range of disciplines, as a major recruitment criteria.

Another limitation of the current study is the deliberate choice to focus on class-to-class Virtual Exchange, while other forms of Virtual Exchange that are organised externally for participants from multiple institutions and sustained by an online facilitator (also called "facilitated dialogue") have not been addressed. Finally, one of the major limitations is the focus upon teachers' self-reported data, whose reliability can be limited by social desirability bias or recall period. While, ideally, the EVOLVE researchers reached out to measure the evolution of teachers' professional competence at different times of their engagement with VE (pre-, while- and post-), the pilot phase of data collection (see section 2.2.1) showed how difficult it is to capture the process of development in a statistically relevant group of otherwise professionally diverse respondents.

Moreover, some may argue that an experimental design should be set up to compare the progression in VE teachers' competences with a parallel control group. While, indeed, it would be an ideal set up for such a large study, it would inevitably require, first, recruiting an equally large group of HE teachers with no VE practice and, then, ensuring that the group is compatible in terms of teaching experience and the development of corresponding competences, which can be considered as unmanageable.

Also, it needs to be emphasised that the current study targets competence development in HE teachers only. Other educational contexts in which VE can be implemented, such as primary and secondary education have not been addressed here, which creates room for further research in this field.

3. Overview of retrieved data

3.1. Collected data

The initial number of teacher responses to the survey, distributed in autumn and winter 2019, was 91; after verification and the exclusion of incomplete or irrelevant entries it was reduced to 53. All 53 teachers were informed about the purpose of our data collection and had signed a consent form.

The teachers who were contacted for a follow-up interview were chosen in order to cover a variety of levels of VE experience, disciplines, and countries. These interviews were conducted from March to April 2020 through a video conferencing software (ZOOM). They were recorded and transcribed. All interviewed teachers were asked to sign and submit consent forms.

Table 1*: Summary of retrieved teacher data*

N teacher survey entries	N teacher survey entries after filtering	N countries	N follow-up interviews
91	53	19	10

3.2. Participating teachers and their teaching contexts

3.2.1. Countries

The 53 teachers who participated in our data collection work mainly in European (N=39), but also in other countries (N=14). In total, 19 different countries are represented: Australia, Belgium, Brazil, Canada, Cyprus, Czech Republic, France, Germany, India, Israel, Japan, Jordan, Netherlands, Poland, Spain, Sweden, Tunisia, UK and the USA.

Figure 1: *Working locations of the teachers participating in our study*

3.2.2. Disciplines

The major disciplines in which respondents' VEs are carried out lie in 5 different fields, as indicated in Table 2 below[7]. These are: 00 Generic programmes and qualifications, 01 Education, 02 Arts and humanities, 04 Business, administration and law and 06 Information and communication technologies. The majority of these VEs are implemented within the field of Language acquisition, often linked to specific disciplinary fields (e.g. in the case of English for specific purposes), but Literature and linguistics studies and Teacher training are also well represented. The other fields include Intercultural competences, Arts, History, Business studies, Entrepreneurship, Marketing and communication, Informatics, telecommunication and physics and Communication. Interestingly, one VE is also delivered as part of professional development programmes for university teachers.

Table 2: *Major disciplines of VEs implemented by research participants*

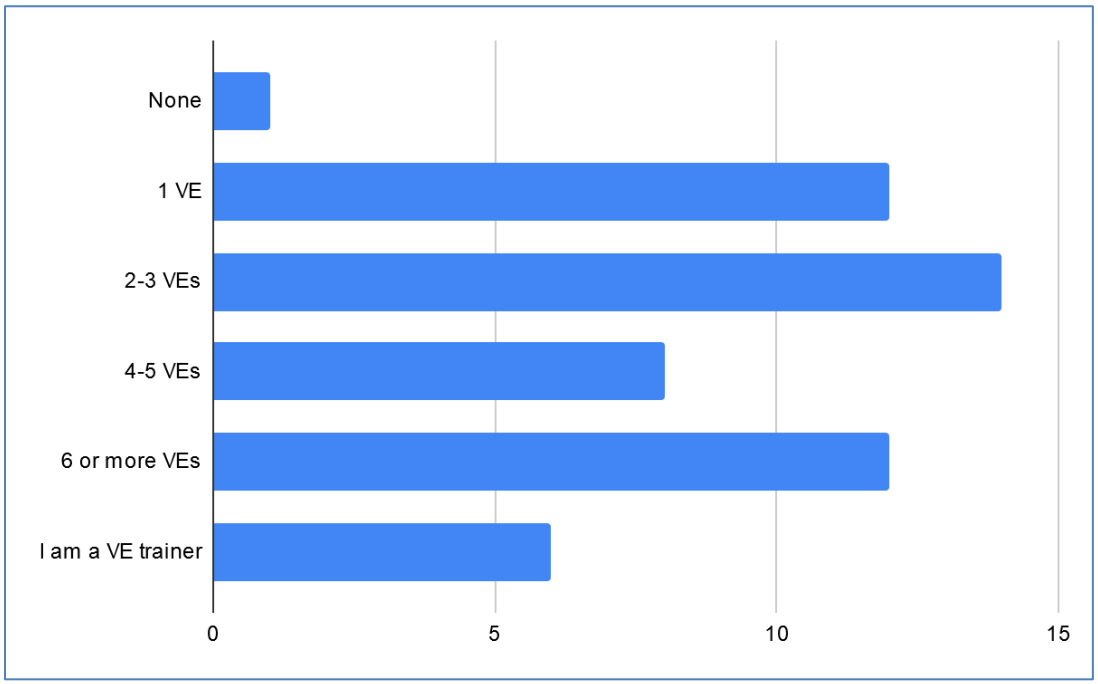
Major disciplines	N VEs	Sub-categories for disciplines	N VEs	Examples
00. Generic programmes and qualifications	2	003. Personnel skills and development	2	Intercultural competence
01. Education	7	0113. Teacher training without subject specialisation	1	Teacher education
		0114. Teacher training with subject specialisation	6	Language didactics
02. Arts et humanities	38	021. Arts	2	Arts
		0222. Humanities (except languages)	1	History
		0231. Language acquisition	28	English for specific purposes
		0232. Literature and linguistics	8	Language studies: German, Chinese, ...
04. Business, administration and law	3	041. Business, administration	1	Business studies
		0413. Management and administration	1	Entrepreneurship
		0414. Marketing and advertising	1	Marketing & communication
06. Information and Communication Technologies (ICTs)	1	0613. Software and applications development and analysis	1	Informatics, Telecommunication, Physics
Non identified	2		1 1	Pedagogical development for university teachers Communication

[7] To be able to classify, group and analyse disciplines and fields of disciplines, the EVOLVE project uses the International Standard Classification of Education (ISCED) framework (version 2013) (UNESCO Institute for Statistics, 2014, p. 18-20).

3.2.3. VE experience

At the time of filling in our survey, teachers had various degrees of previous VE experience. These range from "none" (indicated by one teacher who was carrying out his / her first exchange) to being a VE trainer. The following figure gives an overview on the corresponding numbers.

Figure 2: *Teachers' answer to the question "What is your current experience in implementing VE?*



4. Results: Objectives and reasons for VE

This chapter provides an overview of the reasons that led HEI teachers to implement VE, and the targeted learning objectives.

4.1. Reasons why teachers put VEs into place

The teachers who participated in our study were asked to indicate their main reasons for designing and carrying out a VE. Their answers show not only a variety of motives, but also confirm that a VE is a flexible pedagogical practice which can accommodate various student learning objectives. The 53 teachers indeed indicate a total of 107 reasons, with an average of 2 reasons per teacher. The EVOLVE researchers identified 12 different categories for these indicated reasons (see Table 3 below).

Most of the indicated reasons are related to reaching out to new learning objectives, to achieve the already identified learning objectives in a better way, or to enhancing pedagogical approaches. The learning objectives that teachers consider as a reason for putting into place a VE include:

- enhancing language practice within language or other disciplinary courses;
- fostering intercultural awareness and competence;
- opening up students to a real or global world and thus enhancing skills valued for their employability;
- fostering disciplinary skills (such as business studies, e-learning design, teaching skills), and
- fostering digital competences.

When it comes to enhancing pedagogical approaches, respondents mention fostering transversal competences and providing a meaningful learning situation through the contact with students from other contexts, cultures and languages, fostering student-centeredness (see also section 5.4), and other pedagogical reasons such as "*Diversifying teaching [through] establishing contacts with foreign students*" (T24, survey), providing "*challenge*" (T19, survey) or ensuring "*telecollaboration practice for me and my students*" (T25, survey). Several teachers, through introducing VE, wish to enhance their blended teaching practices, or even to experiment with blended teaching.

Internationalisation is another frequently indicated reason. In order to meet criteria of global university ranking, several universities see VE as a means to foster internationalisation. In this vein, 3 teachers indicate their VE was put into place following an institutional decision. One presents his/her VE as resulting from a visit to a partner university, hence benefitting from an already existing HEI partnership, and 5 mention a personal wish to internationalise their teaching through VE.

Some less frequently mentioned reasons relate to putting into place a VE because:

- the teacher encountered a VE program such as EVOLVE, Erasmus+Virtual Exchange, EVALUATE[8] (Evaluating and upscaling telecollaborative teacher education) or COIL

[8] http://www.evaluateproject.eu

(Collaborative Online International Learning)[9] or even participated in VE training provided by one of these projects or organisations;

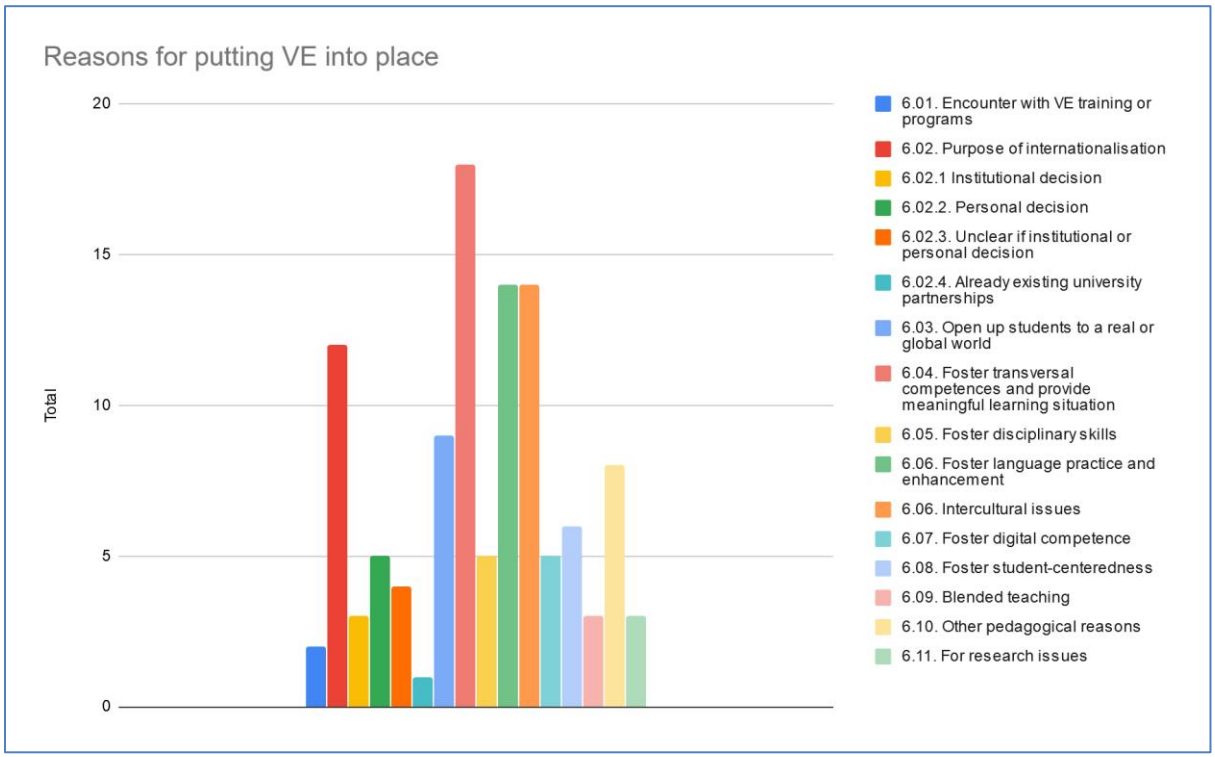
- the teacher has research interests related to VE, such as ICT and language learning, and wants to combine his/her teaching practice and research.

Table 3*: Reasons for putting VE into place, indicated by teachers (total number of teachers: 53), in decreasing order*

Category number	Indicated reasons for putting into place VE	N teachers indicating this reason
6.04	Foster transversal competences and provide meaningful learning situation	18
6.06	Foster language practice and enhancement	14
6.06	Intercultural issues	14
6.02	Purpose of internationalisation	12
6.03	Open up students to a real or global world	9
6.10	Other pedagogical reasons	8
6.08	Foster student-centeredness	6
6.05	Foster disciplinary skills	5
6.07	Foster digital competence	5
6.09	Blended teaching	3
6.11	For research issues	3
6.01	Encounter with VE training or programs	2

[9] http://coil.suny.edu

Figure 3: *Reasons for putting VE into place, indicated by teachers in survey and interviews (total number of teachers: 53)*



4.2. Learning objectives of the VEs

4.2.1. Which are the targeted learning objectives?

Open survey results cast additional light on particular student learning objectives that the responding teachers address in their VE projects. Here the coders identified several frequently reported sets, with ***intercultural competence*** and ***language skills*** being most popular ones (reported respectively by 37 and 34 respondents). Other identified learning objectives include ***transversal and soft skills*** (N=12), understood by teachers as cooperation in intercultural teams, problem solving or team work, as well as a broad category of ***digital competence***, the latter also indicated by 12 respondents. Various aspects of ***global communication and collaboration*** were identified as learning objectives by 8 teachers, with cross-cultural communication skills, examining diverse backgrounds and cultures or task-based interaction being most prominent examples. Another frequently addressed objective includes various forms of ***professional training for future teachers*** (N=8), with respondents pointing to experiential practice or the pedagogical use of ICT as its focal aspects.

The targeted objectives are usually reported in combinations; yet, interestingly, not many teachers (N=3) point to disciplinary skills or content knowledge as central to VE. This can be explained by the fact that in this group of respondents, coming mostly from the field of humanities, language skills and digital competence or sometimes intercultural communicative competence often serve as disciplinary skills which has not been reflected as a separate category in our codes (see Table 2).

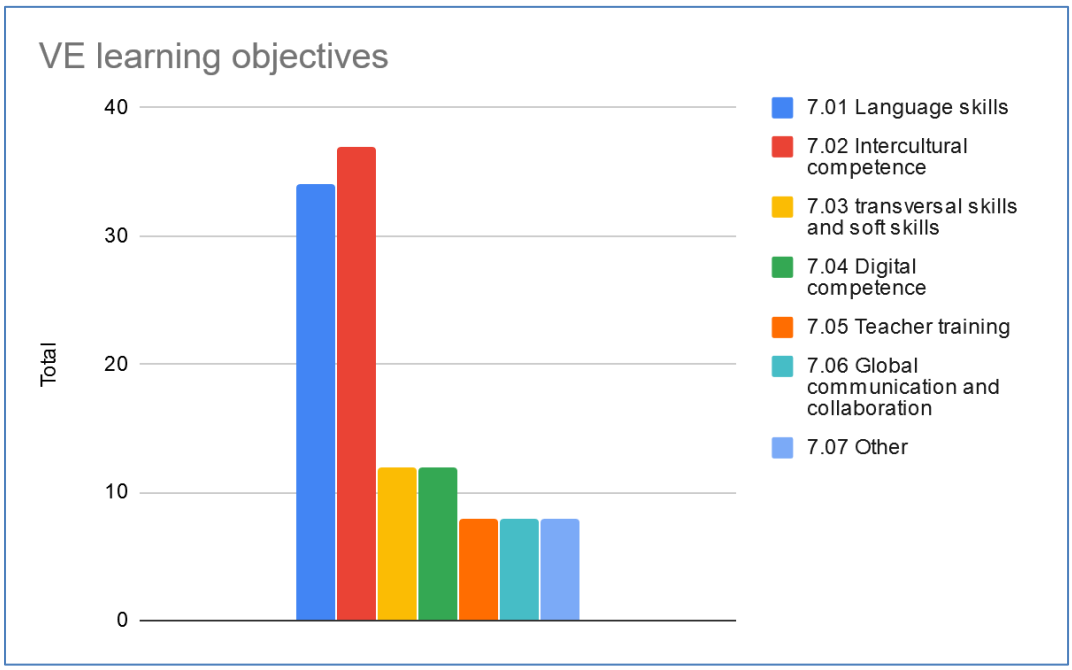
Table 4 below summarises learning objectives most commonly targeted in VEs.

Table 4: *VE learning objectives, indicated by teachers in survey and interviews in decreasing order (total number of teachers: 53)*

Category number	Indicated learning objectives	N teachers reporting the objectives
7.02	Intercultural competence	37
7.01	Language skills	34
7.03	Transversal and soft skills	12
7.04	Digital competences	12
7.05	Teacher training	8
7.06	Global communication and collaboration	8
7.07	Other	8

The above data have been visualised in Figure 4 below.

Figure 4: *VE learning objectives, indicated by teachers in survey and interviews (total number of teachers: 53)*



4.2.2. Does VE help to achieve these learning objectives, from the teachers' point of view?

As the indications in the previous paragraphs show, teachers set up VEs with clear expectations regarding their learning objectives. The question then is, of course, whether these learning objectives are actually achieved. From the teachers' perspective, the answer to this question is mainly positive, which is reflected in a high average score obtained for the question "Do you think your VE allowed your students to progress regarding these major learning objectives of your VE?"

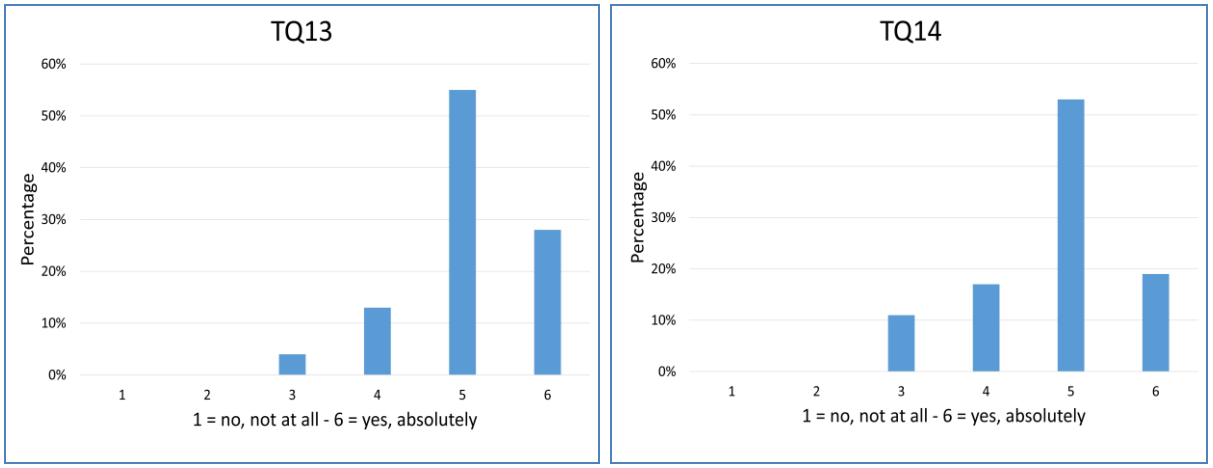
(TQ13). The distribution of responses has been shown in Figure 5 below. Even if several answers are mitigated, most are very positive.

Table 5: *Answers to survey-questions on achieving targeted learning objectives through VE,on a 6 point Likert scale*

Item number	Item	mean value
TQ13	Do you think your VE allowed your students to progress regarding these major learning objectives of your VE?	5.08
TQ14	Do you think you VE helped you students to achieve the course learning objectives?	4.79

The responses regarding students' achievement of the course learning objectives through VE (TQ14) are still positive, but slightly less so (average score of 4.79 out of 6). A plausible explanation for this is the fact that course objectives are most often broader than the VE objectives, and the VE is thus covering a more narrow subset of objectives.

Figure 5*: Answers to survey-questions on achieving targeted learning objectives through VE on a 6 point Likert scale*



5. Results: Evolution of teacher competences through VE

5.1. Development of general pedagogical competences

5.1.1. VE is a learning experience for teachers

Among the 53 teachers who participated in our study, a **general consensus can be observed regarding VE being a learning experience**. In the open survey questions, 19 teachers make explicit general comments on VE as a learning experience, most often along with other more precise explanations. When directly asked about this in our follow-up interviews, also the teachers who did not make such a general comment in the survey (T14, 18, 27, 32, 34, 42, 43), were very affirmative about VE being a learning experience for them. This raises the total number of teachers who globally declare VE is a learning experience to 26, and moreover allows one to assume that other teachers who were not interviewed would agree on this, even if not saying it explicitly or in such a broad way.

Teachers who broadly state that VE is a learning experience have former VE practice that ranges from low to extensive. T27 (interview), who has experienced 2 VEs states: *"I'm definitely learning from the Virtual Exchange (...). In many dimensions"* Or, as T08 (interview) who has carried out 4 VEs puts it, *"Actually I learned. I mean all the learning that happens with the students. I came through this learning process. I was new in the Virtual Exchange. (...) I really opened my horizons"*. Even teachers who have carried out several VEs highlight the fact that they learn something new through every successive one. T26 (interview), who has put into place 6 VEs, confirms: *"It means very much, a very big learning experience. I found every time I conducted one of these, I learned something new"*.

Other teachers make more targeted comments related to specific competences or aspects that they have developed through VE (see section 5.1.4).

VE is an ongoing learning process

Regardless of whether competence refinement is reported in broad or in more detailed terms, there is a general consensus that learning through VE is an ongoing (and never ending) process. T14, for instance, states:

> *"I am still on my way to learn how to manage VE-settings. There is always the need for improvement. Even with my experience in using VE I still find it demanding to motivate and to assess my students" (T14, survey).*

Nevertheless, **several teachers admit they did not directly enhance their teaching skills through VE**, but rather that VE has been a logical continuation of their continuous efforts to renew their teaching approaches and to be learner-centered. These are people who already have had a long teaching career with an already existing focus on open education, student-to-student interaction, active pedagogy. They also declare being open to new teaching trends:

> *"I would say that VE was a logical extension to being an open educator for over 10 years and learning in the open" (T44, survey);*

"Introducing VE did probably not allow me to enhance my teaching skills as such, but to broaden the scope of possibilities, to provide even more space for student-to-student interaction within the courses, and also to improve courses" (T01, survey);

"I could not say that my pedagogical competence has changed much because I have been aware of the developments in the field as part of my teacher education training and since I started teaching. Over the years, perhaps my performance has evolved" (T04, survey).

5.1.2. VE experience allows teachers to refine general pedagogical competences

The competences that are developed or refined through putting into place and carrying out VEs are most often presented as going beyond the specific context of VEs, and are mainly general. During the coding process, the EVOLVE researchers indeed distinguished between statements that were explicitly linked to VE, and those that were not. The number of references belonging to either category, indicated in Table 6 below, show that most of the teachers' statements refer to the development of general pedagogical competences which they see as not restricted to VE contexts.

Table 6: *Number of coding references for development of general vs. VE-specific competences*

	Statement of general teaching competences development or refinement	Statement of VE-specific competence development
In survey	N=207	N=47
In interviews	N=208	N=32
In survey & interviews (total)	N=415	N=79

This is confirmed by our statistical results. By comparing teachers' pre- and post-VE indications on a 6-point Likert scale, we analysed the self-perceived evolution of their skills, attitudes and ease regarding course design, putting into place different teaching approaches and their perception of their own professional development. Items intended to measure teachers' development in the period from before to after their VE experience (see Table 7), show significant progress in our t-tests (see section 2.2.4), . This indicates that teachers with VE experience are very positive about VE being a trigger for a multifaceted evolution of their general pedagogical competences. This is also illustrated by the mean scores for these items at a pre and a post stage: the difference calculated between mean values for pre- and post-VE show increase in all the items, with technology use (+1.08), teacher collaboration (+1.1), promotion of students' online communication (+1.28) and teachers' own intercultural communication (+0.75) being most affected. These data will be elaborated further in the sections to follow.

Table 7: *Comparison of pre-and post-VE items in teacher survey related to general pedagogical competences*

Item number	Item	Pre-VE means	Post-VE means
TQ19_1	I am able to identify the learning objectives of my course and to formulate them clearly	5.02	5.53**
TQ19_2	I am able to put into place tasks that allow students to meet these course learning objectives	4.81	5.3**
TQ19_3	I feel comfortable selecting technology tools for my teaching that sustain the learning activities and aims	4.28	5.36**
TQ19_4	I feel comfortable choosing assessment tasks that are coherent / aligned with the learning aims of the course	4.68	5.06**
TQ19_5	I can use a wide range of teaching approaches	4.60	5.34**
TQ19_6	I feel comfortable promoting effective online communication or collaboration between learners	4.06	5.34**
TQ19_7	I feel comfortable identifying ways to promote my students' critical thinking	4.6	5.28**
TQ19_8	I feel comfortable choosing tasks that engage/motivate students	4.79	5.4**
TQ19_9	I present course goals and task instructions to the students in a clear way	4.75	5.17**
TQ19_10	I feel comfortable adapting my teaching to available resources and constraints	4.96	5.34**
TQ19_11	I feel comfortable adapting my teaching role in accordance with tasks/course demands and constraints	4.83	5.34**
TQ19_12	I collaborate with other teachers /I discuss teaching ideas with my colleagues or with a teaching community	4.28	5.38**
TQ19_13	I have a reflective and critical approach to my teaching	5.09	5.68**
TQ19_14	I continuously try to enhance my teaching / my course design	5.23	5.74**
TQ19_15	I feel confident in my teaching competence	5.15	5.45**
TQ19_16	I have the confidence to communicate or work in a culturally diverse setting	4.87	5.62**

**Significant at p < .01

5.1.3. The transfer of VE skills to other courses

Teachers seldom state spontaneously that the skills they acquired in the context of VE implementation transfer to the other courses they teach (N=1 out of 53 survey answers). Nevertheless, when asked directly, the majority indicate that their other courses and teaching contexts benefit from their VE experience (N=8 out of 10 interviews). This leads us to conclude that teachers do not consider VE and VE-related competences as being a separate entity within their global set of competences, but rather that, to them, VE experience nourishes their teaching repertoire in a more general and interconnected way. This, in turn, suggests that teachers do not transfer isolated competences they gained through VE to other teaching contexts but rather spontaneously draw, in any teaching context, on a full set of competences that has been constructed in various ways, inter alia through VE.

However, when directly interrogated on the transfers they make from VE to other courses, it is especially **the need for clear structuring** that the teachers value, the awareness of which they develop in VE projects and then transfer to other teaching contexts, be it online or blended.

> *"You have to be really clear and really thoughtful in your Virtual Exchange design. I think that definitely helped me to understand that that is just as relevant in your regular blended learning delivery" (T26, int).*

Other things learnt that teachers transfer as a result of their VE experience include:

- project-based learning *("Yes. I do transfer. I'm adopting this kind of pedagogy in all the other courses. I work with projects, problem-based learning in the other",* T08, int.);
- increased technology use in their regular teaching (T43, int);
- the use of online collaborative tools to foster flexibility and collaboration between students (T26, int), especially in small groups (T27, int);
- sustaining the learning process by breaking the task design process into small steps: *"this transfer from this kind of smaller VE projects, where I really take the time to think of all these steps and to think how can I scaffold the learning process. This is also really necessary for these distance learning courses",* T14, int);
- the use of reflective journals (T26, int);
- designing creative tasks, such as digital storytelling, as a way to develop diverse skills on a pedagogical and technological level (T34, int);
- providing more meaningful learning material and tasks: *"For sure, I understand students more. I understand their perspective more. I understand their needs. I realize that they would like to do something meaningful(...). I have to think about the text, the materials, the videos which I provide, which would let them see things through the eyes of others*" (T42, int).

5.1.4. More detailed overview on teachers' general competence development through VE, based on qualitative analysis

As stated above and as shown in Table 7, a comparison of teachers' indications about their general teaching skills before and after experiencing VE shows a significant evolution in many aspects. On the basis of our qualitative data analysis, in which teachers' responses were coded for repetitive themes and then analysed, we are able to gain a deeper insight into which particular competences teachers think they have developed. This is what is presented in the following paragraphs.

The competences that are most often reported as refined in the process of implementing VEs can be put under the umbrella category of "***task [or course] design and constructive alignment***". Indeed, 25 teachers indicate in their open answers that through VE they learned to identify types of tasks that suit specific contexts and objectives.

> *"Yes, other types of tasks. Different outputs aligned with the syllabi, of course, always aligned with a university syllabi. But you can always design new tasks that can be more challenging and more engaging and more meaningful actually" (T34, int).*

Some also report that after VE they choose pedagogical activities and their modalities (e.g. collective work or individual work) more purposefully, in order to help students achieve the targeted learning objectives.

> *"With Virtual Exchange, everything starts from scratch and you don't only want to teach them passive voice or the use of conditional sentences, but you want them to collaborate, you want them to be able to distinguish, to see the value of certain online tools for example.*

> *Then you have to think about it yourself first, then design tasks in such a way, as to give them a chance to master those skills. First you start thinking about the skills, then you think about tasks and at the end you think about the tools and technology which is going to be used so that everything goes into place and it's not done by somebody else. You don't get, like, a ready-made dish from a cafeteria, but you do it yourself. So, you think about the ingredients and become much more aware of what you are doing, while you are doing that." (T42, int)*

This, in turn, goes along with a ***better identification of learning goals and outcomes*** several teachers report on (N=6): *"I am even more aware of how to precisely identify and follow learning objectives*" (T27, survey). Once the objectives are identified, teachers realize it is of crucial importance to present them to the students with utmost clarity regarding work distribution, timeline, expected outcomes and the ways of achieving them. This also includes the space that the students are provided for their personal choices, whether expected or resulting from their own on-task creativity. Several statements underpin teachers' increased attention to ***clarity in the presentation of learning goals and task instructions*** (N=7). T05, for instance, states: "*I feel I have moved towards making more explicit how my learning outcomes / teaching and learning activities and assessment tasks are aligned*" (T05, survey). The need for and practice of formulating clear instructions is linked not only to the fact that students need to be enabled to work on their own within their small groups, but also to the need, for each partner, to have a precise idea what he/she is expected to do and how this is linked to what his / her partners do.

> *"You have to be really exact with the Virtual Exchange. You have to really make it clear. There is so many opportunities for students and teachers to get confused. When there's conflicting information, everybody stresses out" (T26, interview).*

At the same time, this type of approach leads teachers to "***broadening or modifying the focus of [their] teaching goals and outcomes***", which is the second most frequently mentioned developed competence (N=23). Adopting a VE-based teaching approach, often together with a project-based approach, leads teachers to think of aspects and skills students need to acquire for a successful VE experience, and that goes beyond the discipline-specific learning outcomes that would be targeted in a conventional course. Several of these new focuses are:

- intercultural and digital competences: "*You have to think about which kind of technical tools you want to use with your students, if they need an introduction into these tools. If they need an intercultural introduction, if they have to learn something about the other group in advance before they start*" (T14, int).
- communication skills: "*Sometimes they lack the social skills to do the first steps in conversations and it tells me I should teach socializing skills*" (T31, survey).
- collaborative and reflective skills: "*At the beginning [my] teaching was oriented towards linguistic support for the interactions but I noticed the students need support in other areas - support for engaging in the collaboration with the partners, support to go beyond superficial statements, support to reflect on their work and on their learning*" (T02, survey).
- critical thinking and other 21st century skills: "*It's richer now and provides more opportunities for critical thinking.*" (T36, survey). / "*It allowed to promote 21st century skills*" (T25, survey).

Along with modified course goals, a quarter of the teachers state they gain ***greater awareness of the need for scaffolding and guidance*** of their students (N=13). "*Since the focus is on problem-based learning it means the teacher's role must become more of a facilitator*" (T09, survey). VE leads them to be "*more encouraging and orienting [the students] instead of giving them the content to be learned*" (T02, survey). "*Learning how and when to step back and let the learners take control is an important lesson. Learning how to create a safe and trusting environment at first and then slowly stepping back from the teacher role towards facilitation*" (T13, survey). This shift in the teachers' role will be tackled in more detail in section 5.4.

In parallel to this, some teachers' statements show that VE allows them to gain a ***greater awareness of the role of feedback and assessment techniques*** (N=6). A teacher mentions the "*necessity of constant feedback*" (T12, survey). The reflection on assessment and evaluation is twofold. It is, on the one hand, the necessity of integrating the learning process into the assessment criteria that is mentioned.

> *"When you strictly assess a task, you look at the different criteria or rubrics that you may have used but, within an exchange, you're also looking at the level of engagement and level of commitment, and how far students went within their partnerships to produce those outputs" (T34, int).*

On the other hand, it is the search for a most equitable and student-centered form of assessment, including peer-assessment strategy: "*assessment that includes the students' self-reflection and peer-assessment in addition to the teacher's instead of being teacher-based only*" (T07, survey).

Putting into place VE enhances, more generally, teacher's ***flexibility and adaptation skills*** (N=15). This is, first, due to the fact that teachers need to re-think their teaching approaches and course content in order to purposefully integrate VE, and, second, a VE is based on team effort of international students and international teachers working together at two different levels. It is therefore not unusual that unforeseen events occur at either level, which requires teachers to find solutions in a proactive way - through preparing a plan B in case if - or else in a reactive way, once the problem has occurred. As T14 puts it, "*I think I'm more brave now to (...) conduct these kinds of projects, because I think: "Ok well even if there's something going wrong, well I know how to deal and how to manage this""* (T14, int).

Almost a third of the teachers (N=16) report on a ***general reorientation of [their] teaching approaches***. "*I believe VE has brought new lenses through which [I] look at the contents I have to teach in each course*" (T15, survey). They mention an "*other work organization in lessons*" (T24, survey), and that "*my course design approach has become less theoretical and more realistic*" (T12, survey).

This is partly caused by the encounter with their partner teachers, their partners' contexts and teaching styles. Many teachers (N=17) value this ***inspiration, collaboration and support from their international partner teachers***. "*Working with VE means also sharing ideas with colleagues from other HEI, learning [more] about their way of teaching, teaching subjects, advantages. This is very inspiring and influences my teaching*" (T14, survey). Working with colleagues from other cultures is seen as broadening one's horizons (T8, int). Two types of work relationship are reported on. One is peer-to-peer learning among teachers, where each of them contributes to not only organising the VE, but also constructing a learning experience for themselves:

> *"I think it was a great experience and I'm very happy that I was there with a great partner. I think that made a great difference. Everyone at every point was totally goal-oriented and relation-oriented so it was very constructive" (T27, int).*

The other type of relationship occurs when VE newcomers work together with more experienced VE partners and learn from them, but still contribute to the teacher teamwork: "*I did not really design that much of my VE as I did it with partners who were already doing it, but I contributed ideas and changes*" (T16, survey).

A well functioning teacher-to-teacher relationship with regular discussion of how to proceed within the VE is seen as a fundamental requirement for a successful VE.

> *"The fact that my partner and I, we've worked very closely together and we've met, I mean he was here twice. I met with him, we sat down and we worked together and I think that's crucial. I felt that we have a language, we work well together" (T43, int).*

Since VEs require several organisational steps before they can be put into place - such as finding a partner, identifying tasks that are relevant for the different partners' contexts and courses, identifying adequate tools, etc. - as well as continuous discussion between the partner teachers, several teachers (N=9) note that they ***refined their planning and organisation skills***. "*If you want to start such a project, you have to have a plan. You have to have a time schedule, you have to break the goal down in smaller steps and in tasks*" (T14, int). T44 adds that his/her "*organizational skills, awareness of barriers and opportunities, have all evolved*" (T44, survey).

Other improvements that teachers note as a consequence of their VE experience are factors that help them more generally to enhance their teaching ability. Overall, they gain an ***increased confidence in their own teaching skills*** (N=10). "*I have gained confidence as a teacher. I no longer hesitate to experiment with new teaching ideas and projects*" (T30, survey). Several teachers report on having developed a greater ***reflection on their teaching*** (N= 9), as this quote illustrates: "*The greatest skill is reflection. I can reflect more critically now on the work done. I feel I am more able to evaluate myself, my work and the effort put in the design of a task or the conduct of a lesson*" (T49, survey). VE experience is seen as a means for "*continuous personal development*" (T47, survey) by some teachers, or else awakens the wish to develop their professional competences further. More precisely, this ***increased orientation towards personal and professional development through VE*** (N=7) is expressed through the intention to learn even more about VE (T27), eventually by doing an advanced VE training (T27), through discovering one's ability to write a paper on one's teaching and VE practices when being encouraged by the partners (T42), and through seizing the opportunity for more professional development by diversifying VE partners (T08). As one of the teachers nicely states, "*I'm shocked that I can develop and I can do things I've never done myself! This is really important, gives me lots of joy*" (T42, int).

It is interesting to note that several of the competences the teachers indicate they develop or refine through preparing, organising and putting into place a VE when cooperating with their VE partner teachers are just the same competences that VEs often target at a student level (see section 4.2). These refined personal competences are various. The following list presents them in decreasing order of occurrence.

- **Refinement of teachers' digital competences** (N=19) (e.g. "VE has improved my digital literacy and has become a platform for all kind of innovative teaching experiments :-)!" (T38, survey)
- Refinement of teachers' intercultural competences (N=13)

- ***Refinement of teachers' transversal skills*** (N=10), such as cooperation skills with international partners, creativity and critical thinking.
- ***Developing new personality traits*** (N=7), such as learning to slow down and to listen to others (T18, int), "become a more sympathetic teacher" (T12, survey)
- ***Refinement of teachers' language skills*** (N=2)

Table 8: *Refinement or development of general teaching competences, categories in decreasing order of occurrence (total number of teachers: 53)*

Category number	Category of refined teaching competence	N teachers reporting the refined teaching competence
1.01	VE as learning experience	26
1.04	Refinement of (task) design skills and constructive alignment	25
1.03	Broadening or modifying the focus of one's teaching goals and outcomes	23
1.16	Refinement of digital competences	19
1.10	Appreciation for teacher inspiration, collaboration and support	17
1.02	General reorientation of one's teaching approaches	16
1.14	Increased flexibility and adaptations skills	15
1.08	Greater awareness of the need for scaffolding and guidance	13
1.17	Refinement of intercultural competences	13
1.12	Increased confidence in one's teaching skills	10
1.18	Refinement of one's own transversal skills	10
1.05	Refinement of planning and organisation skills	9
1.19	Increased teacher reflection	9
1.20	Transfer of teachers' VE skills to other courses and contexts	9
1.21	No change in general teaching competence	8
1.07	Clarity in the presentation of learning goals and task instruction	7
1.11	Increased orientation towards personal and professional development through VE	7
1.13	Developing new personality traits	7
1.06	Better identification of learning goals and outcomes	6
1.09	Greater awareness of the role of feedback and assessment techniques	6
1.15	Refinement of one's own language skills	2

5.2. Development of VE related competences

5.2.1. VE specific competences teachers develop

Other competences teachers state they developed through VE are explicitly linked to the specific context of VE. Again, as in section 5.1., design skills are a frequently mentioned outcome of VE practice (N=16), this time referred to as ***VE design skills***.

> *"I am continuously learning how to use design in various ways in order to encourage active participation, provide scaffolding, and promote learning. This is however an ongoing process, and as a teacher I am realising how crucial design is for rewarding learning experiences" (T29, survey).*

The development of other competences is mentioned by a lower number (respectively maximum 7) of teachers. Along with VE and task design, some teachers (N=6) report on increasing their competence in ***aligning tasks and tools in VE***. Their encounters with new tools, coupled with extensive practice and reflection on the use of tools lead them to being more comfortable identifying tools that suit the purpose of designed tasks. As T34 (survey) states, "*I feel more confident in integrating technology in my teaching and design tasks that are motivating and engaging for students*".

Integrating a VE into a given course fosters not only teachers' VE design skills, but also their competence to ***align this VE with the face to face sessions of their course***. This is what 7 teachers acknowledge. One mentions his/her refined competence of allotting each course modality - either online or face to face - a specific assessment function (T32, int). Others more broadly report that they progressively increase their ability to combine both course modalities.

> *"For example in a business course, the students are supposed to learn how to put together a business plan and carry out a market research, and how to use different, let's say, ways to design a product and put it out in the market. So, this was part of the curriculum and within the exchange, all these steps that they should go through, were informed from their partnerships. So, they designed their business products together, tailored to the different communities and they designed thema market research interview" (T34, int).*

With practice, teachers also feel more comfortable in ***handling conflict and tension in a VE project*** (N=6).

If general mentions of enhancing their assessment skills were made by a number of teachers (see 5.1), the evolution of specifically ***VE-related assessment skills*** is also stated. As T30 (survey) puts it, "*I have discovered new ways of keeping track of their progress and getting feedback from them*".

Through VE experience and the encounter with their partners' practices, teachers also enhance their ***general knowledge about VE and its different existing types*** (N=4). "I believe I've become more aware of the different types and models of VE there are", states T07 (survey). One teacher particularly emphasizes his/her discovery of online teaching and learning differing from face-to-face modality: "*It's a major learning experience that the virtual context obviously has other rules to follow than the face-to-face context*" (T27 int).

Figure 6: *Development of VE-related competences, indicated by teachers in survey and interviews (total number of teachers: 53)*

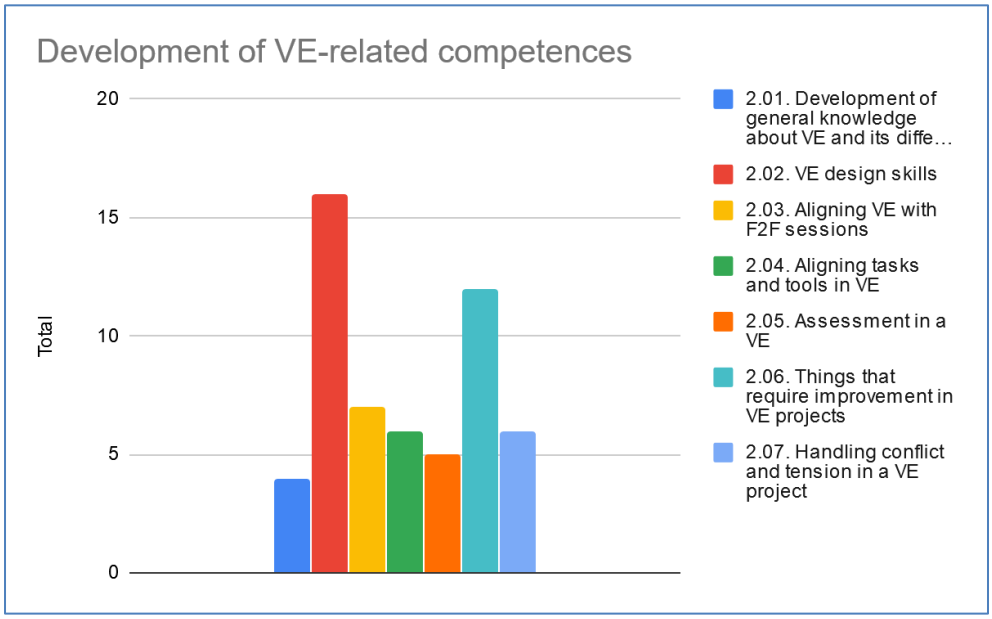


Table 9*: Development of VE-related competences, indicated by teachers in survey and interviews (total number of teachers: 53)*

Category number	VE-related competences	N teachers reporting the competences
2.02	VE design skills	16
2.06	Things that require improvement in VE projects	12
2.03	Aligning VE with face to face sessions	7
2.04	Aligning tasks and tools in VE	6
2.07	Handling conflict and tension in a VE project	6
2.05	Assessment in a VE	5
2.01	Development of general knowledge about VE and its different types	4

5.2.2. Aspects that require improvement within VE

As mentioned above, VEs tend to lead teachers to modify their teaching approach, and also to go along with unforeseen events. Implementing and experiencing VE is not a river without troubled waters. Almost a quarter of the teachers (N=12) therefore explicitly mention techniques, strategies or approaches that did not fully work in their VE and which they are in the process of improving, or else they intend to improve in the future, for the next round of their VE or for another VE. The focus of the teachers' statements is not complaining but looking for better solutions. The aspects that they undertake to redesign concern:

- student evaluation and assessment (T11, T26, T34, T42), an aspect that requires several VE iterations in order to be successively improved:

> *"It has been a challenge to plan and also to perform assessments, but definitely is worth it and improving every day" (T11, survey)*
>
> *"For sure, I have to work on evaluation. This is something which is not well developed, well planned. You cannot do everything when you start, like between your first Virtual Exchange, you just learn what it is like. Doing the second one, you improve things. We have introduced many elements which we didn't have before" (T42, int);*

- modifying the learning outcomes indicated in the curriculum, in order to better fit to what students get out of the VE (T27, int);
- selecting students for the VE: if not all the students within a course, but only several ones participate in a VE, a teacher expresses the intention to identify and apply precise criteria for selecting these students (T32, int);
- being more patient and flexible regarding the partners' VE input (T18, int);
- providing active pedagogy online (T27, int);
- allowing for more space for student agency regarding the definition of the task design: "*the students were not so much involved in the design of the tasks, this could be also tried in the future*." (T02, survey);
- taking into account students' individual learning styles and objectives: *"But I think I could do much more and deal more with individual differences or trajectories of learning*" (T02, survey);
- *"problems and/or conflict handling in VE"* (T27, survey).

5.3. Remaining challenges

In other cases, dysfunctioning aspects of VEs were perceived not as something teachers had undertaken or intended to overcome, but rather as VE-inherent challenges and difficulties.

Here, ***assessment*** resides, again, at a top level position of indicated challenges (N=9). It is the balance between assessing task completion and student engagement that T34 finds difficult.

> *"You don't want to penalize students for, let's say, lack of accuracy or for not meeting the assessment criteria on the different rubrics, because you appreciate that they went to great lengths within their partnerships, in order to work together and collaborate. So, this balance between assessing the students' tasks and appreciating their commitment and their enthusiasm was challenging for me" (T34, int)*

Differing numbers of course credits (ECTS) between the participating countries may represent another hurdle. "*They see from the start that it's not quite fair and maybe they do not feel fully rewarded for the effort.*" (T42, int). Moreover, institutional requirements for assessment criteria may make it hard to find adequate assessment strategies within VE (T50).

VE is a time-demanding activity for both students and teachers. 9 teachers therefore report on ***timeframe challenges***, wherein distinct subcategories can be identified. On a student level, heavy workload in other courses may cause a lack of time and hence to low student engagement in their VE (T08, int). On an organizational level, when a course needs to address various parts of content, teachers may find it challenging to fully integrate VE into the course (T42, int). Moreover, working with people from geographically distant countries requires teachers to adjust their academic calendars to find a viable period for class-to-class cooperation. As the calendars differ from country to country, it creates another hurdle to tackle (T26 int, T33). It may also make it difficult

to find time slots that will accommodate all partners if they live in different time zones (T26, int). On a teacher level, since VE calls for detailed organization and for student guidance as well as "*a lot of feedback*" (T03, survey) by teachers, it needs specific time investment (T18, int). In line with this, on an institutional level, T14 claims for increased VE recognition and for being credited supplementary teaching time: "*I think you need more time allocated [for] in your working plan for this kind of projects*" (T14, int).

In terms of ***organizational challenges*** (indicated by 6 respondents), teachers mention their lack of control over the courses they are allocated to teach at the beginning of a term, which makes it difficult to establish a long-lasting VE partnership. As already tackled above, another important challenge is finding partner teachers who are reliable (T43, int), whose discipline allows for elaborating tasks that suit course objectives on either side (T11, survey), and for setting up VE tasks that reach out for intense student interaction (T18, int). In the same vein, in some courses it is difficult to have the same students in the preparative VE phase, and then during the actual VE, especially when it takes place in the following term and there is some student turnover (T42, int).

Technology challenges were mentioned by 6 teachers. Most of them report on lacking digital competence. They find it difficult to choose adequate tools (T27, int; T33, int), to use them properly (T32, int) and to teach students how to use them (T33, int). One also reports on students' difficulties to use the computer keyboard for a target language with letters other than Latin (T33, int). Newcomers to VE are therefore sometimes scared of technology use: "*I have taught several workshops on how to start up a VE project, but most of my colleagues are scared of the technology and the potential pitfalls*" (T46, survey). A supplementary challenge occurs when tools that work well are not approved by the HEI, causing therefore the need to set up and to collect signed student consent forms in order to be able to use this tool (T42, int).

In spite of the fact that many teachers observe that their task, course and VE design skills have greatly improved through VE practice (see 5.1.4 and 5.2.1), some of the respondents report on remaining ***course design or task sequencing challenges*** (N=5). For instance, teachers find it difficult to reconcile the different international teaching contexts and the learning objectives to be addressed via VE. Moreover, "*Aligning your delivery, not only from a pedagogy point of view but, from a timing point of view, is really difficult*" (T26, int). And, since VE often calls for addressing skills other than the purely disciplinary skills, some teachers state it takes away from disciplinary content:

> *"I feel I do not advance as much in content, but definitely is more meaningful and purposeful for my students" (T11, survey).*

In a similar vein, ***challenges in aligning F2F with VE sessions*** are mentioned (N=4). Whenever the integration of VE into the course is not sufficiently taken care of, or does not fit the course objectives well enough, teachers observe lack of student motivation and the shift of their attention away from the project. In this case VE is "*perceived by students often as an add-on to essential coursework*" (T37, survey). Purposeful alignment between F2F and VE sessions is sometimes achieved only after several VE iterations.

> *"I might need another and more VE courses in order to combine VE with F2F course elements" (T27, survey).*

VE is mainly carried out between small groups of international students working together. Hence, ***student partnering challenges*** can occur. Whenever only a given number of students in a course can participate in the VE in order to accommodate the number of students from partner institutions, teachers find it challenging to set up criteria for choosing them and to find the right number of student partners (T32, int). One also finds it difficult to identify strategies for student matching (T42, int).

Another expressed challenge is an identified ***need for institutional support*** (N=4). Although several institutions aim at internationalisation, they do not necessarily allocate time for teachers who implement a VE.

> *"It costs more time but I do not get something from university for it. (...) This is what I would recommend to my university: more support for the teachers who are interested in this kind of projects" (T14, int).*

Other institutions yet need to be persuaded of the added value of VE projects.

> *"Convincing my authorities that Virtual Exchange is useful, that maybe it's not offering the syllabus, like semester projects are part of the syllabus, but maybe not necessarily done internationally. Convincing them that it's worthwhile, that it's something useful, maybe even more beneficial for the students" (T42, int).*

It may also be the status of the teacher within his or her institution that is questioned.

> *"I think it has something to do with being an ESP teacher in France...we are not always treated by faculty as a discipline or experts in our own right, but often as service providers" (T05, survey).*

Lack of institutional support is identified as a possible reason for teachers' giving up on this type of pedagogical practice.

> *"I myself have not run any VE projects lately because of several reasons (lack of time, lack of funds, lack of support from management, etc.)" (T46, survey).*

Table 10: *Remaining challenges, indicated by teachers, in decreasing order*

Category number	Indicated remaining challenges	N teachers reporting the challenges
3.09	Other challenges	10
3.01	Assessment challenges	9
3.05	Timeframe challenges	9
3.04	Organizing challenges	6
3.07	Technology challenges	6
3.02	Course design or task sequencing challenges	5
3.03	Challenges in aligning f2f with VE sessions	4
3.08	Need for institutional support	4
3.06	Student partnering challenges	2

Other challenges indicated by teachers include challenges on an international level such as, e.g. a VE not taking place despite preparative planning and organization being done (T18, int), which can happen due to limited L2 competence of the partner teacher or because of external factors - in this case COVID-19.

Another reported challenge is student frustration resulting from various VE-related difficulties (e.g. local or remote partners lacking engagement or lack of commitment from the partner teacher). "*Many of the students felt that the [VE] was time-consuming, frustrating and they didn't feel that they got out of it what I had promised*" (T18, int).

Also, some teachers may find it difficult to accept dependence on other VE players, either partners or institutions.

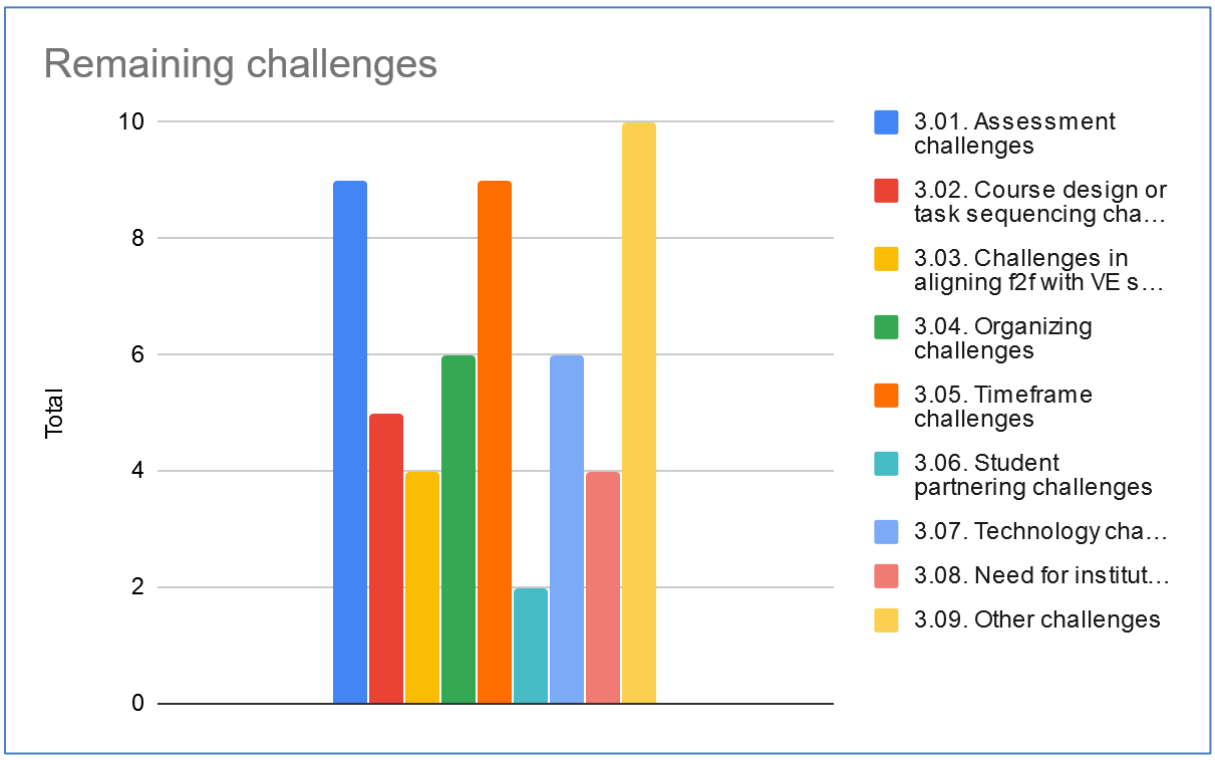
> *"So I need to think about external realities, more complexe, on which I don't have any power. I need to trust people outside my organization. This is as exciting as challenging..." (T53, int).*

Teachers also point to challenges emerging on a local level, for example teachers not authorised to modify the course design and, thus, not being able to fully integrate the VE into his/her course "*so my VEs remain something additional* (T45 survey).

Another group of challenges emerges on a student level. These may include students' initial shyness (T08) or insufficient motivation (T14, T32). As T02 puts it, "*VE remains challenging for me, because [...] I see the students are not enough prepared to work differently or to allocate extra time for collaborative projects*" (survey). Another aspect which is pointed out in this context is inadequate level of students' language competence, which inevitably hinders communication attempts between the partners (T43).

Figure 7 below presents a visual representation of remaining challenges.

Figure 7: Remaining challenges, indicated by teachers in survey and interviews (total number of teachers: 53)



5.4. The impact on student-centeredness

Since VE is an interaction-based learning environment, its efficiency is strongly linked to the intensity and quality of international student-to-student communication and collaboration. Therefore, one of the major research hypotheses guiding the current study was the assumption that implementing a VE may increase the degree of student centeredness in teaching practices of the involved teachers, since peer-to-peer interaction is one of the potential ways of putting into place such student-centeredness.

Indeed, in line with this initial assumption, teachers' responses show a significant increase in the degree of self-perceived student-centeredness in their teaching, as compared **before and after** implementing VE in one or several courses (Table 11). This has been first confirmed in **statistical results**, with teachers' responses indicated on a 6-point Likert scale. The aspects compared in the teacher questionnaire included: 1) teachers' self-declared change in the generally perceived student-centeredness, 2) the degree of encouraging students to create their own understanding of course content, 3) the student-to-student interaction, as well as 4) the intensity of collaborative approaches to teaching. As Table 11 below shows, the items (statements) in all the four categories show significant increase (from a statistical point of view (p-value) and as is also illustrated by the mean values in this Table), with the greatest increase reported for student-centredness (TQ16_1 +1.09) student-to-student interaction (TQ16_3 +0.96) and collaborative learning (TQ16_4 +0.93).

Table 11: *Comparison of pre-and post-VE items in teacher survey related to student-centeredness and space for interaction:*

Item number	Item	Pre-VE means	Post-VE means
TQ16_1	My teaching or course is student-centered.	4.43	5.25**
TQ16_2	I encourage my students to create their own understanding of the course content.	4.38	5.11**
TQ16_3	My course allows for student-to-student interaction.	4.66	5.62**
TQ16_4	My teaching or course is based on a collaborative approach to learning.	4.60	5.53**

**Significant at p < .01

Open answers from both teacher surveys and interviews provide a valuable insight into the different forms that teachers' approaches to student centeredness can take, and do take, in VE related contexts. These have been identified by the authors of this report as belonging to the categories indicated in Table 12 below:

Table 12: *Competences related to student-centeredness, in decreasing order*

Category number	Type of student-centeredness	N references in survey & interviews	N of teachers reporting
4.02	Creating room for student agency and autonomy	54	26
4.01	Self-perceived declaration of a shift to student-centeredness in teaching (general)	30	22
4.08	Developing new ways for nurturing student-centeredness	23	19
4.07	Creating additional space for student communication and collaboration	34	16

Category number	Type of student-centeredness	N references in survey & interviews	N of teachers reporting
4.05	Developing and taking into account the understanding of students unique needs, emotions and expectations	31	15
4.04	Increased teacher's cooperation with students and building positive rapport	29	13
4.03	Encouraging students to create their own understanding of the course	12	7
4.06	Promoting student reflection	13	7
4.09	No VE-related change or improvement	8	5
	Total	**234**	

The data show that almost half of the responding teachers (N=22) overtly declare that implementing VE helped them shift towards student-centered teaching, which they see as beneficial to their overall teaching competence:

> *"My teaching is much more student-centered after the VE projects I ran" (T46, survey).*
>
> *"My teaching skills have improved drastically through helping students to (be) more independent in their learning" (T33, survey).*

Yet it is also interesting to note that some of the respondents (N=8) make it very clear that student-centeredness of their teaching is not a direct outcome of VE experience but, rather, is consistent with their overall, previously shaped teaching approach and the perception of their role as a facilitator or "guide on the side" rather than an instructor:

> *"I already had a perception of the teacher as a facilitator" (T03, survey).*
>
> *"I think that my teaching before VE was already student-centered, but I realized that it's even more with VE" (T41, survey).*
>
> *"It ratified what I had been doing in class for years" (T50, survey).*

This is very much in line with the previously reported trend that for many teachers embarking on VE is a logical continuation of their already shaped orientation towards active pedagogy (see section 5.1.1.). However, even though some of the teachers view themselves as already oriented towards the student, they also see VE as prompting further refinement within this approach. Again, data analysis allowed the researchers to identify several sub-categories pertaining to those aspects of student-centered teaching which respondents see as impacted by VE implementation.

The most frequently reported one concerns ***creating more room for student agency and autonomy*** and, with that, various forms of delegating responsibility for the learning outcomes to the students themselves (N=26). As T12 overtly puts it: *"I have come to understand the importance of student agency"* (T12, survey), while T18 states:" *(VE) made me more focused on letting students have independence in designing their own work*" (T18, survey).

A greater focus on students' independence is also reflected in respondents' revised perspective on teacher's and student's roles. A commonly highlighted feature in this category is that of the teacher delegating even more control over the learning process to the learners and allowing them to acquire the role of leaders (e.g. T7, T14, T18). As T33 explains:

> *"In that sense, it is moved gradually from being the one who leads the process to become less involved with the teaching process (...) So, it was more in a way giving the opportunity for students to take the lead in that sense" (T33, int).*

In line with the above, teachers also point out to their growing awareness of the various subtleties involved in how **teacher and student roles are realised.** For instance, they highlight a further shift towards seeing their own role as **supporters and organisers** rather than knowledge providers. As one of the respondents explains, it is through VE that the locus of control moves to learners who can make their own learning choices and decisions*: "I provide the scaffolding and the necessary structure but these are the students who do most of the work"* (T9, survey). This form of students' empowerment is seen by T13 (survey) as a metaphorical journey "*from consumers to producers".*

T51, while referring to VE-induced student communication and collaboration, notices the following shift in his/her responsibilities:

> *"Rather than being involved in every conversation about our learning focus, I can help to mediate multiple conversations that have happened and help to draw connections between them or problematize certain topics" (T51 survey).*

In this regard, it is also interesting to note how differently teachers perceive their own role in supporting student centeredness as such. These approaches range from giving students a high degree of freedom (e.g. *"They decide what they want to do, how they want to do it and they draw the conclusions themselves* - T42 int;), to the realisation that student centeredness lies, in fact, in the teacher's hands and needs to be nurtured rather than left to its own devices:

> *"It taught me that student-centeredness must be very carefully nurtured and monitored"* (T48, survey).

The analysis of teachers' responses confirms that the implementation of VE helps them realize that student-centeredness is an approach which exists in various guises and degrees and, as such, can be intensified even in those cases when teachers thought it had been properly nurtured before.

> *"(...) this giving ownership to the participants is now even stronger. I feel that in the virtual context it has to be made clear that the learning moments are carried out by the participants. I'm transferring it much more to the participants which I already did in the face-to-face but it gets clearer in the online context " (T 27, interview)*

Another aspect which is linked to student centeredness and which is frequently reported by respondents (N=16) includes the awareness of the need for ***additional space for communication and collaboration*** which, as teachers notice, is missing from conventional classrooms. Here, teachers stress that VE creates an authentic context in which students can learn from one another, which teachers also perceive as important to their own professional development:

> *"Another thing that I learned is that I'm not the only person that would provide knowledge, but that students will learn from each other's experiences. When I put them with others, they learn a lot from. It's really more effective than like I'm lecturing. This learning process that's happening between the students, my students and students from other cultures, is a noticeable source of knowledge for them, that I really appreciate. I step back and I want them to get into this experience and to learn a lot from this experience" (T08, int).*

In a similar vein, even though collaborative tasks are frequently used in conventional classrooms, teachers' responses show their **increased sensitivity to the role of collaboration** (e.g. T26, T 31, T42). As T09 explains: *"I realize that the students can achieve more when they collaborate in groups. The more diverse groups the better"* (T09 survey).

Our analysis shows that teachers also increase their awareness of students' autonomy in VE communication tasks, in which students can move beyond the areas traditionally established (and, thus, also controlled) by teachers, especially in the context of culturally sensitive themes:

> *"In the Virtual Exchange, especially when they come from different cultures, they would like actually to know everything about the other cultures, would get into the area. We call it the taboo area. They can talk about it, especially when they feel that they are not being monitored. However, in the classroom, as a teacher, you don't want to lose control. You don't want people to get into that area, about things that culturally are not accepted" (T32, int).*

One can be tempted to conclude that VE experience helps teachers to become more reflective about the amount of control they typically exercise in their courses and recognize new avenues in which students' leadership can take off.

Interestingly, teachers - who predominantly see themselves as learning through VE (see section 5.1), also notice the correlation between their own experiences and the competences they can promote in their students. In that sense, **their own collaboration with VE partnering teachers builds experiences** which they can draw on in their own teaching.

> *"I didn't collaborate with anybody online and obviously my students didn't collaborate much. If they did, like to design their semester project, I didn't really know about it because they did it in Polish, did it outside of the classroom. I guess I had, maybe no skills or non-existent, or skills I wasn't aware of. Then if I wasn't aware of them, how could I teach my students any of the skills? That's why improvement is significant because it started from zero to something. Now I can collaborate with international partners (...). I can make my students work, can give them guidance, can show them the way" (T42, int).*

Another aspect which deserves a closer look in the context of student centeredness is the ***development of new ways of understanding and nurturing*** it, reported by as many as 19 teachers. Respondents frequently highlight the fact that although their teaching was student-centered before, VE created a new environment in which it can be now cultivated differently (T6, T37, T43), through new (digital) tools (T27, T43), with a stronger focus on critical thinking and language skills (T42) or with additional space for practicing new genres (T42).

> *"Our classes are focused on student-centered approaches. The VE has given us more ways to ensure our students are central in the process of planning and teaching" (T06, survey).*

A pronounced shift towards student-centeredness is linked to the concept of a safe learning environment and, with that, a need to take into consideration students' needs and emotions which in VE situations may run high. Our data analysis shows that, indeed, the emotive dimension is a frequently highlighted issue which takes the form of teachers' increased ***sensitivity to students' unique needs, emotions and expectations*** (N=15). Here, teachers highlight the broadening of their usual teaching focus to include students' personal development rather than the mere fostering of course-related skills (T09, T39, T42). In the process, teachers develop a new, more personal perspective and greater empathy towards students (T12, T42). T42 emphasizes that VE

gave his/her "*insight into students' minds, problems, worries, fears, things they do not normally talk to teachers*" (T42 int), which changes the way one "*looks at their performance*" (T02, survey).

This newly discovered personal perspective was pinpointed by T42:

> *"VE has allowed me to start noticing and exploiting the potential hidden in each student. Their command of English is not the only resource that we resort to during our English classes but we try to build on the various other skills students bring to class and do not normally use when doing traditional exercises" (T42, survey).*

This strong focus on the student has been summarised by T09, who admits that she "*learned to look at things through the students' eyes"* (T09, survey).

A category which seems to be strongly linked to teachers' emotional sensitivity is their ***increased cooperation with students and building positive rapport*** (N=13). This aspect is mentioned in the context of a more personal communication and shared responsibility for project outcomes.

> *"I think, in some way, I have another much more engaging dialogue with my students.(...). We can also laugh about things together. So, it's a funny thing. I think, when I do these kinds of projects, we always see it like it's our project, it's not only my project. It's something I do together with my students and this is really encouraging" (T14, int).*

What is striking is that increased teacher-student cooperation is a quality not only noticed by the teachers themselves, but also experienced (and reported) by their students:

> *"That was something that was truly evident in the data that I collected through their written reflections and focus groups. They emphasized that these projects got them closer with their teacher because we had to keep communicating" (T34, int).*

The issue of intercultural experience and, with that, also increased vulnerability to challenges and struggles appears to make teachers realise that they do not need to hide beyond the traditionally established formal role but to show their "human" face:

> *"I have become more aware of how important it is to be honest with your students and yourself about your abilities and limitations" (T48, survey).*

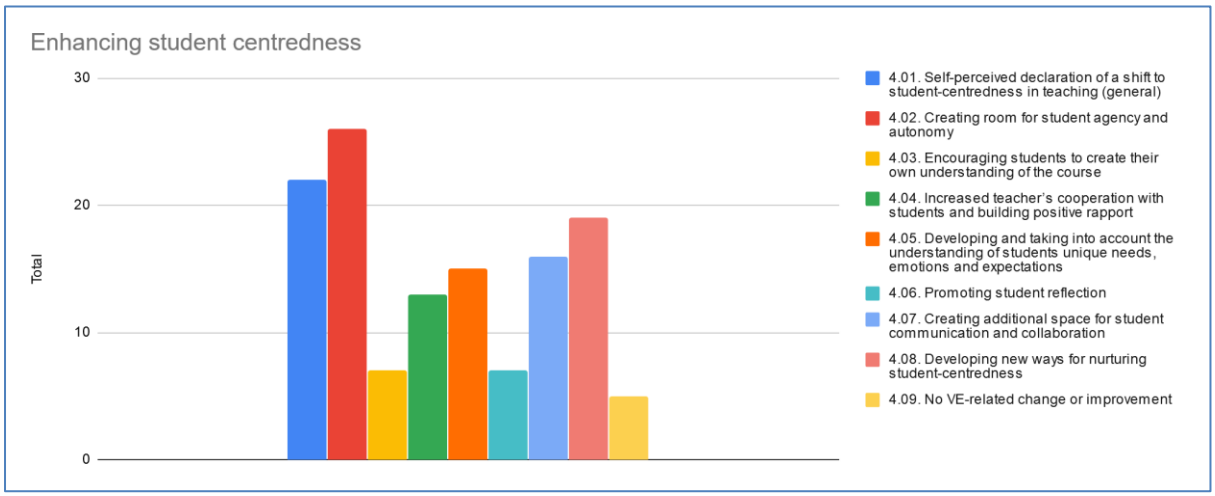
> *"It's a good way to show students how i struggle with some difficulties myself , so it made me more flexible and open to students' feedback" (T28, survey).*

Finally, increased teacher-student collaboration and, with that, also trust and shared responsibilities are reflected in students' greater involvement in the planning and decision making process (T1, T14). As T14 explains: "*I hand over more responsibility to my students. We discuss and in some cases plan together"* (T14, surv). This also leads to teachers giving more attention to ***promoting student reflection*** (N=7):

> *Now, I understand even more the importance to learn and so I propose in my courses tasks that will help my students to reflect on their learning and to become more autonomous" (T41, survey).*

Figure 8 below is a visual representation of the data discussed above.

Figure 8: *Enhancing student-centeredness through the implementation of VE as indicated by teachers in survey and interviews (total number of teachers: 53)*



5.5. VE in the times of COVID

The aspect which cannot be neglected in this study is the impact that the COVID-19 crisis and the consequent university closures had on teachers' perception of VE. Since the data collected in the second round of our research (see section 2.2.1) covered, at least partly, the beginnings of the pandemic, the distress it had caused was reflected in teachers' emotional comments and reflections, especially in the recorded interviews (references to COVID were coded in 8 out of 10 interviews). The COVID-19 crisis had unprecedented global impact and resulted in a sudden and prolonged lockdown of all public places, including the educational sector. Therefore, the exchanges planned for the summer term 2020, if not cancelled, were inevitably delivered as distance courses, with serious disturbances to the original planning.

In general, teachers' accounts of the crisis belong to two main categories, namely 1) comments referring to teachers' former VE experience as facilitative of their sudden switch to remote teaching; 2) comments describing distress and confusion brought about by pandemia and requiring urgent readjustments of VE delivery. They will be discussed below.

5.5.1. Transfer of VE-based competences in times of COVID pandemic

One of the aspects that teachers notice is the immediate relevance of their VE experience to the global shift to distant learning triggered by the outbreak of COVID-19. This is what T26 witnesses:

> *"I think it's been a fantastically valuable learning experience for doing what we're doing now to cope with COVID-19. It's been seriously, for teachers to be throwing into their own backyard, and have to teach online, which we all have to do at the moment in Australia. That's the skill set of what I learned from working online and communicating and collaborating online from Virtual Exchanges has been priceless. I've seen the teachers, let's say 20 or 30 teachers I know, that I've worked with, who have delivered Virtual Exchanges, are also well equipped to be doing what we're doing now. So even though this was completely unexpected, it is a skill set that I think you really need to have, to be able to be adaptable,*

> *and to be able to move quickly to online if, and when, you need to. I think that has been incredibly valuable" (T26, int).*

In this context these are particularly teachers' VE-related skills that are brought to the fore by research respondents. As T31 commented on the development of his/her newly acquired VE competence: *"It has evolved in a timely manner to meet the COVID-19 crisis"* (T31, survey). In his/her very personal account, T42 appreciates a smooth transfer of digital competence acquired as a result of VE experience to other online contexts: *"All the techniques and tools I've learned doing Virtual Exchanges, I could easily use during the pandemics panic situation because I was able to move smoothly into online teaching. All the skills were there"* (T42, int).

Moreover, the spread of pandemic and the ensuing necessity to switch to entirely online teaching, created an authentic context for many VE-related activities. As T42 pinpoints: *"Today you have to do it because we all stay at home* (T42, int).

5.5.2. Difficulties in carrying out VE because of the pandemic

While teachers with prior VE experience benefited from their previously acquired VE-skills, the situation took a heavy toll on pre-planned VE formats and activities, forcing teachers to redesign VE activities and topics on the last minute basis and, with that, display enormous flexibility and adjustment skills. T42 recollects:

> *"Nothing really worked the way we planned. We've been planning for many months since October. Then we had to modify everything, starting with topic, with a theme, because we wanted to invite, can you imagine, we wanted to invite Chinese tourists (...) to Europe (...)" (T42, int).*

Another challenge reported by teachers results from mobility restrictions and prolonged lockdown. This in particular precluded many exploration tasks which teachers had planned to be performed in intercultural teams. For example T42, whose students were to work with partners on the exploration of their cities, redesigned the theme in the following way:

> *"So, my personal perception of the city in the time of crisis: How do people cope? How do businesses cope? Tourism businesses? How do families celebrate Easter virtually? How do people celebrate birthdays nowadays? All sorts of ideas that students have to explore in various forms" (T42, int).*

While the blended format is believed to be the most suitable to ensure productive virtual exchanges, the projects carried out in the time of pandemic required teachers and their students to go entirely online, which created a new emotional layer to which teachers had to react. T42 comments on his/her evolving partnership with the students involved: *"(...) we all stay at home, so there must be some kind of collaboration, between students and teachers and between students and students"* (T42, int).

6. Main findings and conclusions

In this report we have presented the data collected from a statistically relevant group of in-service academic teachers implementing Virtual Exchange in their courses. Our purpose was to investigate how experiencing VE affects the evolution of pedagogical competence of the involved teachers - a perspective which, to our knowledge, has not yet been researched in a large-scale study. Qualitative and quantitative analyses presented in this study make it possible to draw several findings.

As the data show, teachers' decisions to put into place a VE stem from various reasons. These include, among others, renewing their teaching approach and experience, finding a meaningful way to address student learning outcomes, but also responding to an institutional or a personal wish for internationalisation. A large group of respondents (N=26) broadly acknowledge that they see VE as a means for developing their general pedagogical competences. For those of them who are experienced teachers already conscious of the value of active pedagogical approaches, VE is a way of renewing their teaching repertoire and finding other methods of nurturing learner-centeredness.

As our analysis shows, the competences that are developed or refined through putting into place and carrying out VEs are most often presented as going beyond the specific context of VEs. Rather, they blend into teachers' overall pedagogical expertise. Interestingly, the incentive to experiment with VE comes in several cases from teachers' encounters with various VE initiatives such as the EVOLVE project or others (EVALUATE, Erasmus+ Virtual Exchange, COIL) and, hence, discovering the existence of VE practices. This underpins the importance of such initiatives for the expansion of VE within HEI in Europe and worldwide.

When it comes to our first research question, both qualitative and quantitative analyses provide strong evidence that **VE experience has a positive impact on the development of teachers' general pedagogical competences** in all the investigated categories, and hence validate our first hypothesis. Interestingly, several of the competences that teachers refine or develop through the process of preparing and delivering VE in collaboration with partnering teachers are the same as those they aim to foster at the student level. This is in line with the findings of the EVALUATE project (The EVALUATE Group, 2019). More specifically, this refers mainly to teachers' digital competence, intercultural awareness and transversal skills; in rare cases teachers also refer to enhanced language skills (see section 5.1.4). This is supportive of teachers' general statement that they see VE as an important learning curve in their professional development.

One of the aspects clearly influenced by teachers' VE experience is their heightened awareness of the need for clarity in the presentation of learning goals and task instructions**:** Teachers learn through their VE practice the need for clarity of VE instruction, and for indicating to students the choices and obligations they have - as also observed in other online or blended learning settings (see Nissen, 2020).

VE and task design - or transferable course design skills - appear as major learning outcomes of teachers' VE practice. Constructive alignment (Biggs & Tang, 2013) is a central element in these design skills. In this context it refers not only to aligning tasks and assessment, but also tools with learning objectives. This result finds its counterpart in the practitioners' and researchers' advice

for teachers on how to design a VE and choose adequate tools (e.g. Mont & Masats, 2018; Melchor-Couto & Jauregi, 2016, p. 187).

One of the most complex aspects of VE, frequently reported in terms of a challenge are assessment strategies. The complexity doubles as teachers strive to make assessment not only coherent with learning objectives of their own course, but in many cases also aligned with the partners' assessment. This is because VE involves group work on an international level, which inevitably calls for assessment strategies that take into account not only the individuals, their development and participation, but also collective outcomes. Moreover, teachers pay attention to those assessment criteria that enhance student motivation rather than discourage them from participation. In many cases, assessment within VE projects remains, at least to some extent, an unsolved challenge.

With regard to our second research question, as we indicated above, in many cases competence refinement and development indicated in multiple teachers' statements has been categorised in this study as belonging to general pedagogical competencies, rather than VE-specific ones. This is because the said refinement is integrated into a broader set of competences that teachers then also use for courses other than only those which are VE-enhanced. Yet, other statements bring to light competences that are more specifically linked to VE contexts. On the basis of our analyses, we are able to validate our second research hypothesis, which stipulated **that the process of designing and delivering VE has an impact on teachers' skills and competences directly related to VE**. It is mainly the specific design of VEs and its inherent task settings that teachers learn to set up, as well as the purposeful choice and use of tools for communication and collaboration aligned with these tasks. Since this type of pedagogical practice is inherently based on student-to-student teamwork scaffolded and supported by the teachers, the latter also learn to face occurring challenges and conflict within groups of international students. The students' VE tasks and online interaction need to be carefully aligned with F2F sessions that take place locally, without the partner students; in this area too, teachers report progress.

Our third research question pertained to how **VE influences teachers' approaches to nurturing student centeredness in their courses**. While initially we assumed (as research hypothesis 3) that VE experience would make teachers move from transmission pedagogy to student centeredness, the results show that embarking on VE is a natural consequence of teachers' already developed orientation towards the student and its logical continuation. A very strong student orientation is visible also in the fact that, within our process of data collection, most of the responding teachers prefer to focus on their students' development rather than on their own. It takes specific questions to make them reflect on their own progression.

In a similar vein, our analysis confirms the other part of our initial hypothesis, namely that teachers implementing VE in their academic courses shift their teaching from knowledge transmission towards student-centeredness, which is in line with results from a study carried out by Ensor, Kleban & Rodrigues (2017, para. 156). While many respondents, as said above, embark upon VE with a previously developed strong student focus - as they report themselves - the experience of designing and then delivering VE makes them further refine this approach, which is evident in several aspects related both to teachers' beliefs about their role and actual teaching practices. For instance, one of the greatly affected aspects is the amount of control that teachers execute, often unknowingly, over the learning process. Through VE, teachers become more aware of students' diverse skills and talents and, therefore, become more inclined to create space for their leading role and the autonomous choice of tools, conversation topics and ways of task

completion. Interestingly, teachers' understanding of their role in supporting student autonomy vary and may range from enthusiasm for students' independence to the realisation that student agency and autonomy need to be actively nurtured and sustained by the teacher.

Another aspect of student-centeredness which is visibly affected by teachers' VE experience is the flattening of classroom hierarchies and developing a better understanding for students' needs. This seems to result, at least partly, from the fact that VE is a learning experience not only for students but also for teachers, enabling the latter to relate to the emotions that students are going through. As one of the respondents puts it - teachers learn to "look at things through the students' eyes" (T09, survey). A greater focus on the process of learning rather than teaching results in teachers' increased readiness to embrace students' diversity and support them in their cognitive, social and emotional development. Reflection tasks in particular create space where VE teachers, through their feedback and direct interventions, can establish a safe learning atmosphere - a necessary condition for successful learning (Kurek & Müller-Hartmann, 2018).

Data analysis and, especially, the insight offered by qualitative data, shows that HE teachers have their individual stories to tell, where the points of departure are obviously defined by their educational cultures, unique teaching experience and the beliefs they hold about what it takes to be a good teacher. Regardless of this great diversity, an overarching conclusion to be drawn from this study is that VE serves as a form of experiential learning not only for the students but also for their teachers, for whom adopting this practice is an important learning curve.

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Figures

Tables

Appendix A: Teacher Survey

ROUND 2 EVOLVE Teacher survey

TQ1 Dear Colleague,

We are approaching you as a Virtual Exchange practitioner. As part of the EVOLVE project, which aims to mainstream Virtual Exchange (VE)* as an innovative form of collaborative international learning in Higher Education, we do conduct research into the evolution of pedagogical skills of teachers implementing VE. We therefore kindly ask you to fill in this survey.

- EVOLVE will not share your personal data with any third party.
- EVOLVE will not mention your name in any of its reports or scientific publications based on this survey.

In accordance with the General Data Protection Regulation (GDPR), you have the right to access and require rectification of the personal information that has been collected about you. If you wish to enforce this right and obtain the information about you, please contact evolve@rug.nl.

This survey consists of 5 pages. It will take you 12 to 20 minutes to complete it.

We would be very grateful for your help.

With kind regards

The EVOLVE Team

*) VE is understood as task-based online exchange between students from geographically distant institutions, under the guidance of their teachers or moderators, over a certain period of time, and with pedagogical objectives.

TQ2 Do you give consent to the EVOLVE project team to use your answers to this survey for analysing the evolution of teaching skills at different stages of the project?

- Yes
- No

TQ3 Your name

_____

TQ4 Your institution

_____

TQ5 Your country

(Scroll-down list with possible choices)

TQ6 Your email address

(this address will be used, exclusively, in order to allow us to get back to you eventually for short further explanations related to your answers*)*

_____

TQ7 What is you current experience in implementing VE (Virtual Exchange)?

- None (0)
- 1 VE
- 2-3 VEs
- 4-5 VEs
- 6 or more VEs
- I am a VE trainer

TQ8 Were you trained for VE (e.g. online training, workshop on VE)?

- Yes
- No

TQ9 You selected "Yes" in the previous question. What sort of VE training did you receive? I learned through ....

- formal online training
- formal training workshop
- non-formal training (conferences, contact with peers/partner teachers)

TQ10 *For the following four questions, if you have implemented more than one VE, please think of the one that is most representative in your eyes.*

TQ11 What is the major discipline of your VE? (e.g. Physics; English)

_____

TQ12 What are the major learning objectives of your VE? (e.g. intercultural aspects, language skills, ...)

_____

TQ13 Do you think your VE allowed your students to progress regarding these major learning objectives of your VE?

(1 = no, not at all - 6 = yes, absolutely)

TQ14 Do you think your VE helped your students to achieve the course learning objectives?

(1 = no, not at all - 6 = yes, absolutely)

TQ15 What were the main reasons for you to start putting into place and carrying out a VE?

_____

_____

_____

_____

_____

TQ16 **Teaching/course** (Student-centeredness and interaction)

Please think of how your VE experience might have contributed to the evolution of your general teaching practices/abilities (e.g. by comparing the course that includes your VE with your former teaching practices). To what extent do you agree with the following statements?

(1 = no, not at all - 6 = yes, absolutely)

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
My teaching or course is student-centered												
I encourage my students to create their own understanding of the course content												
My course allows for student-to-student interaction												
My teaching or course is based on a collaborative approach to learning												

TQ17 Please provide comments on how the introduction of VE influenced your approach to teaching

_____

_____

_____

_____

_____

TQ18 What impact, if any, has had the introduction of VE on the level of student-centredness in the course(s) you teach?

_____

_____

_____

_____

_____

TQ19 **Teaching skills** (in the context of Virtual Exchange (VE) and more generally speaking)

Please think of how your VE experience might have contributed to the evolution of your general teaching practices/abilities (e.g. by comparing the course that includes your VE with your former teaching practices). To what extent do you agree with the following statements? *(1 = no, not at all - 6 = yes, absolutely)*

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
I am able to identify the learning objectives of my course and to formulate them clearly												
I am able to put into place tasks that allow students to meet these course learning objectives												

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
I feel comfortable selecting technology tools for my teaching that sustain the learning activities and aims												
I feel comfortable choosing assessment tasks that are coherent / aligned with the learning aims of the course												
I can use a wide range of teaching approaches												
I feel comfortable promoting effective online communication or collaboration between learners												
I feel comfortable identifying ways to promote my students' critical thinking												
I feel comfortable choosing tasks that engage/motivate students												
I present course goals and task instructions to the students in a clear way												
I feel comfortable adapting my teaching to available resources and constraints												

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
I feel comfortable adapting my teaching role in accordance with tasks/course demands and constraints												
I collaborate with other teachers /I discuss teaching ideas with my colleagues or with a teaching community												
I have a reflective and critical approach to my teaching												
I continuously try to enhance my teaching / my course design												
I feel confident in my teaching competence												
I have the confidence to communicate or work in a culturally diverse setting												

TQ20 Please comment on how your general teaching skills have evolved through the introduction of VE.

_____

_____

_____

_____

_____

TQ21 **Virtual Exchange (VE)-specific skills / knowledge**

Please think of how your VE experience might have contributed to the evolution of your VE specific abilities/knowledge (e.g. by comparing the course that includes your VE with your former teaching practices). To what extent do you agree with the following statements?

(1 = no, not at all - 6 = yes, absolutely)

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
I am aware that various types of VE exist												
I am aware of the choices I have in terms of types of tasks for a VE												
I feel comfortable setting up a VE in my discipline												
I feel comfortable selecting technology for a VE in my discipline												
I feel comfortable designing or adapting tasks for a VE in my discipline												
I feel comfortable sequencing tasks for a VE in my discipline												
I am able to establish a safe learning atmosphere for students online VE interaction												
I feel comfortable handling conflict and challenge in a VE												
I know how to assess my students progress in a VE												

TQ22 Please provide comments on how your VE specific teaching skills have evolved through designing and carrying out a VE.

_____

_____

_____

_____

_____

TQ23 **Combination of VE and other course sessions**

Regarding your current teaching practices, to what extent do you agree with the following statements? *(1 = no, not at all - 6 = yes, absolutely)*

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
I design class sessions that prepare, sustain and reflect on the VE online interaction												
I feel comfortable combining VE tasks and other course contents / tasks in a meaningful way												

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6

TQ24 Please provide comments on how your course design / design skills may have evolved through combining online VE interaction and other course contents/tasks

_____

TQ25 **Designing and carrying out a VE...**

To what extent do you agree with the following statements?

(1 = no, not at all - 6 = yes, absolutely)

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
... changed how I perceive the role of a teacher												
... made me aware of the influence of task design on student interaction												
... made me aware of the influence of task design on student collaboration												

	Before carrying out my first VE:						Today:					
	1	2	3	4	5	6	1	2	3	4	5	6
... allowed me to enhance my overall pedagogical competence												
... allowed me to enhance my overall technical competence												
... allowed me to enhance my intercultural competence												

TQ26 Please provide comments on how your pedagogical competence has evolved through designing and carrying out a VE

_____

_____

_____

_____

_____

TQ27 Do you think of running a VE again in the future?

(1 = no, not at all - 6 = yes, absolutely)

Appendix B: Interview questions

Semi structured interview questions for teachers

The questions in bold characters were asked to all teachers, the others were complementary questions.

- **Would you characterize your experience of designing and carrying out a VE/ VEs as being a learning experience for yourself? Please specify.**
- **Are there any remaining challenges you consider you are (still) facing regarding designing and carrying out a VE/ VEs? Please specify.**
- How would you describe yourself as a teacher putting into place a VE/VEs, as compared to your former teaching?
- **In what way did designing and carrying out a VE modify or enhance your teaching skills? Please give a concrete example.**
- **Which aspects of putting into place and carrying out the VE had the greatest impact on you as a teacher?**
- Did designing and carrying out a VE enhance several of your teaching skills that go beyond the skills specifically linked to VEs? Please give a concrete example.
- Do you consider putting into place a VE/VEs led you to make your teaching more student-centered? Please give a concrete example
- Do you consider putting into place a VE/VEs led you to allow for more space for interaction in your course? Please give a concrete example
- **Did designing and carrying out a VE lead you to change your teaching approach also in other courses? Please give a concrete example.**
- Could you give a concrete example of how you combine VE tasks and other course contents / tasks in a meaningful way?
- **What are the main remaining challenges you consider you are (still) facing with regard to your skills related to combining face-to-face sessions and your running a course integrating a VE? Please give a concrete example.**
- **How many students do you have in the course the VE takes place in?**
- Could you very briefly explain who were your VE partners and what kind of tasks the students had to complete?

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